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ABSTRACT

The Individually Prescribed Instruction (IPI) program provides instruction based on specific objectives correlated with placement instruments, teaching methods, and individualized materials for wide ranges of differences in the classroom. The program was implemented in the five elementary schools of Lowndes County, Georgia, in 1970-72. This study was conducted to determine the effectiveness of the second year of the IPI program relative to the objectives and needs assessment of the Lowndes County Schools. Based on the analysis of experimental and control student scores, the dimension of student achievement appears to have been differentially affected by the IPI program. The findings of this study suggested six recommendations: (1) the IPI program should be continued; (2) a study should be made on the time demanded; (3) a committee should conduct a study on the demand for services; (4) techniques for community involvement should be continued; (5) expanding the program should be considered; and (6) a program for gifted children should be developed. (Author/BW)

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IPI AND BEHAVIOR

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IPI AND BEHAVIOR

AN EVALUATION OF COGNITIVE AND AFFECTIVE CHANGE

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Nellie J. Spinks
July 28, 1972

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CHAPTER ONE

INTRODUCTION

In the early 1970's, many elementary schools across the nation adopted curricula and methods for individualizing learning for students. One available program was Individually Prescribed Instruction (IPI) which was developed by the Learning Research and Development Center at the University of Pittsburgh. This IPI program operated under the auspices of Research for Better Schools, Inc. (RBS) in the five elementary schools of the Lowndes County School System in the State of Georgia during the 1970-72 school years. These elementary schools were part of the RBS national network of demonstration and training schools for IPI. Demanding a systems change for the roles of teachers, administrators, and students, the IPI program provided instruction based on specific objectives correlated with placement instruments, teaching methods, and individualized materials for wide ranges of differences in the classroom. The IPI schools in Lowndes County helped provide feedback to RBS on the applicability of the program. In this way, the schools assisted in constant revision and refinement of the individualized materials and methods.

STATEMENT OF PURPOSE

The purpose of this study was to determine the effectiveness of the second year of the IPI program relative to the objectives and needs assessment of the Lowndes County Schools. The research was conducted primarily for funding agencies requiring an evaluation of the IPI project. However, it can be used by educators interested in individualization in the classroom as well as by students of institutional change. Behavioral scientists will find the influence of the program on multiple areas of the cognitive and affective domain especially intriguing. Laymen interested in educational accountability and quality education may find this volume pertinent in their review of educational innovations. Finally, participants in the program can use the study as a mirror by which self-perception can be compared with the objectivity inexorably a part of research.

CONTEXT

To facilitate an understanding of the variables used to analyze and to interpret the data compiled for this evaluation, the context of the program has been included herein. Specific attention has been given to the locale, the historical background, and the need assessment.

Locale

Created by an act of the Georgia Legislature in 1825 and located in the southern part of the State of Georgia, Lowndes County encompassed 506 square miles which, according to the 1970 United States Census, were populated by approximately 55,112 citizens. The chief incorporated towns and cities of the county included Clyattville, Dasher, Hahira, Naylor, Remerton, and Valdosta. The Grand Bay River, the Little River, and the Withlacoochee River intersected the county and provided the major waterways along with numerous natural and constructed lakes. Interstate Highway 75, U. S. Highways 41, 84, and 221, and state roads offered transportation to the various parts of the county. Bordered by Brooks, Cook, Berrien, Lanier, Echols, and Hamilton Counties, Lowndes County could be located on a regional map fifty miles west of the Okefenokee Swamp, seventy-six miles east of Tallahassee, Florida, and eighty-eight miles south of Cordele, Georgia.

The economy of the area was based on an aggregate of industrial and agricultural production. Agrarian products centered chiefly on tobacco, forestry, cattle, corn, hogs, and dairy goods. Gross farm product sales for 1970 totaled approximately twelve million dollars. A substantial economic stimulus came from Moody Air Force Base located in the northeastern part of the county. Since the early 1940's, it operated as

the headquarters of the 355th Pilot Training Wing (ATC). Some seventy industries employing twenty-five or more individuals existed in the area. In addition to these, numerous small businesses flourished. Unions represented only a small percent of the labor force. The unemployment rate for 1971 was 3.3 percent; that is, 740 out of a 22,740 work force were unemployed. The effective buying income per household and per capita was approximately $9,200 and $4,500 respectively.

Most residents were native United States citizens. Transient individuals were chiefly migrant farm workers and Air Force personnel. Representing some twenty religious faiths, the churches and synagogues numbered 102. The 1970 United States Census showed the two largest racial groups in the county were Caucasian and Negro, comprising seventy percent and twenty-nine percent of the population respectively. A combination of Mongolian, Indian, and unspecified groups comprised one percent of the total population.

The county government consisted of a three-member Board of Commissioners of Roads and Revenues. These officials were elected for four-year terms of office. Agencies and services available to the populace included the Lowndes County Department of Family and Children's Services, the Lowndes County Mental Retardation Center, the Valdosta-Lowndes Animal Shelter, the County Health Department, the Four-H Extension Camp, the Office of Economic Opportunity, the Valdosta Housing Authority, the Vocational Rehabilitation Center, the Employment Service, and the Georgia Department of Labor. Serving the health needs of the area were seven nursing homes, two hospitals, forty-five physicians, two psychiatrists, and sixteen dentists.

Two airlines, three rail lines, and eight motor freight companies provided public transportation. Four local radio stations, three area television stations, one telegraph company, one daily and one weekly newspaper, and one telephone company maintained public communications. A 98,886 volume Valdosta-Lowndes Public Library served the area in an ultra-modern $328,000 building. It maintained four area branches in the county as well as bookmobile services.

Educational facilities available included a public migrant kindergarten, public and private schools with grades one through twelve, a vocational-technical school, and a four year state college. With an enrollment of 321 full-time and 1597 part-time students, the Valdosta Area Vocational-Technical School trained full-time students in eighteen areas and part-time students in over forty areas. Housed in a recently constructed complex, it was supported by two school systems. Several non-secular private schools served the area offering a small teacher-pupil ratio and specialized training programs in business and cosmetology. Valdosta State College was the only institution of higher learning in Lowndes County. Functioning as a co-educational liberal arts college with an enrollment of approximately 4,000 students, it offered

undergraduate and graduate programs leading to bachelor's and master's degrees.

The School System

Ranking thirty-fifth among Georgia's 193 school systems in mean calculations of student average daily attendance (ADA), Lowndes County schools had a total gross enrollment of 7,090 with an average daily attendance count of 5,802 in 1971. The system ranked well above the state 1970 median ADA of 5,365.

Five elementary schools, two junior high schools, and one comprehensive high school housed the students in the county. These schools operated a number of programs to supplement and enhance the curriculum. Educable mentally retarded classes and a program for the gifted existed in every school. A drug alert program operated on a county-wide basis. Special learning disability classes, perceptual motor learning classes, remedial reading classes, and vocational training classes functioned in the schools as well. A program for the multi-handicapped, a center for trainable mentally retarded classes, a kindergarten for migrant children, a hospital home-bound program, and a speech therapy program gave aid to students on the basis of need.

The IPI program functioned in elementary schools with staffing that included a principal, an assistant principal, a librarian, teachers, and teacher's aides. Table 1 shows the number of each type of staff member by schools. Table 2 presents the number of pupils and classrooms in each of these schools.

TABLE 1

LOWNDES COUNTY ELEMENTARY SCHOOL PERSONNEL

School	Aides	Administrators	Librarians	Teachers
Clyattville	7	2	1	22
Hahira	7	2	1	23
Lake Park	8	2	1	26
Pine Grove	17	2	1	48
Parker Mathis	8	2	1	24

TABLE 2

NUMBER OF STUDENTS AND CLASSROOMS IN THE LOWNDES COUNTY ELEMENTARY SCHOOLS

School	No. Pupils	No. Classrooms
Clyattville	511	18
Hahira	539	22
Lake Park	644	25
Pine Grove	1041	31
Parker Mathis	545	20
All Schools	3280	116

The educational preparation and experience, as exemplified by teaching certificates issued by the State Department of Education, offer some evidence of the potential for excellence in instruction. Table 3 below shows the state certification levels of faculty members and administrators in each elementary school. With the exception of only seven individuals, the faculty members and administrators held at least the four year certificate and a considerable number held higher certificates.

TABLE 3

STATE CERTIFICATION LEVELS OF LOWNDES COUNTY ELEMENTARY SCHOOL FACULTY AND ADMINISTRATION

School	Number and Types of Certificates			
	Six Year	Five Year	Four Year	Less Than Four Years
Clyattville	1	3	20	1
Hahira	0	3	23	0
Lake Park	0	2	27	0
Pine Grove	1	6	38	6
Parker Mathis	0	2	25	0

Historical Background and Need Assessment

During the 1968-69 school year, curriculum became the focus of attention in the elementary schools of Lowndes County. The ability of the schools to help all children achieve academically in an equitable environment appeared in a state of crisis. The existing curriculum evolved over many years to be academic expectations sufficient for the socialization of the majority of students. The emphasis was placed on the average child concept, and students at either end of the hypothetical continuum of ability were labeled and placed in special programs separated from the mainstream for acceleration or remedial purposes. The existing curriculum structure did not lend itself to educational accountability because it failed to specify measurable objectives, tasks, and expected outcomes. After extensive study by school officials, the decision was made to adopt a different frame of reference for the elementary school curriculum. This different frame of reference assumed that individual differences could be dealt with in every classroom and that each child at all times should be learning what was most appropriate for him relative to his ability, interests, and achievement level. In short, complete individualization became the target. It is appropriate to note that this expressed concern for a different frame of reference did not solely originate with administrators but appeared to be the consensus of faculty and administrative groups alike. An examination of the topics discussed in a one-day Desegregation Workshop on October 17, 1969, is supportive evidence for this point. At the Desegregation Workshop fifty mixed groups of Negro and Caucasian teachers discussed problems related to desegregation in the schools. The instructional program and the need for individualization emerged as the principal topics in thirty-five of the fifty groups.

In response to an expressed need, the curriculum staff in consultation with principals and teachers formulated a high priority list to which the curriculum should address itself. These needs are listed below:

1. Equality of educational opportunity
2. Self-determination
3. Congruency between instructional theory and educational practice
4. An educational program based on research, continuous evaluation, and revision
5. Educational accountability

At the request of the elementary school principals in the spring of 1969, Dr. Robert Leigh visited the county schools and conducted a workshop for the elementary personnel. The workshop offered teachers and administrators an opportunity to become familiar with the philosophical underpinnings of individualization in curriculum and the rationale for adopting various individualized learning programs. Numerous other workshops and conferences related to these concerns during 1969.

They functioned as a vehicle for involving members of the community, local school personnel, professors from the University of Georgia, and officials of the Georgia Department of Education in the common effort of exploring various alternatives to the existing instructional methods in the elementary schools.

Curriculum personnel investigated and considered a variety of individualized programs for possible adoption in Lowndes County. Some of these were the Learning Activities Package (LAP), the UNIPAC program of the Kettering Foundation, the Individually Prescribed Instruction (IPI) program, and the Teacher Learning Unit (TLU). To facilitate the decision-making process, a special committee selected two IPI demonstration schools, the Richland Elementary School in Quackertown, Pennsylvania, and the Downey Elementary School in Harrisburg, Pennsylvania, for visitation. The special committee consisted of three elementary school principals, two county curriculum directors, the county project coordinator, the county superintendent of schools, two education professors from the Georgia State University System, and a representative from the Georgia Department of Education. Representatives from Research for Better Schools, Incorporated, as well as the principals and teachers of Richland Elementary School and Downey Elementary School, consulted with the committee members during visitation time. The committee made special efforts to interview several students from a variety of socio-economic backgrounds and who possessed different mental abilities. Note should be made that these IPI demonstration schools were located in dissimilar neighborhoods; one served essentially a middle class area and the other served a lower socio-economic area.

After a visit to the IPI demonstration schools, the committee strongly recommended IPI, believing it the most appropriate individualized instructional program for adoption in Lowndes County. Concurrently, the need for funds to support such a program became evident to the committee members. While local funds were considered, the committee became cognizant that local taxpayers had failed to become enthusiastic about attempts to collect additional money for innovative programs in their initial stages of development. This lack of enthusiasm could be seen in historical perspective through attempts to increase revenues for schools. In 1969 the Board of Education increased revenues for maintenance and operation of the schools through a property re-evaluation and equalization program. This made it feasible to reduce the millage levied from twenty mills in 1968 on a $32,139,437 tax digest to fourteen mills on $56,399,713 in 1969. The value of a mill increased by 75 percent in a year's time.

A bond referendum of $1,320,000 for constructing eighty-five new classrooms at seven school locations passed on May 7, 1969. These

facilities were necessary to comply with a court-ordered desegregation plan and to continue a school consolidation program. However, a poor market at the time forced the offering of the bonds at a discount to attract buyers. At the same period, inflation affected the building costs, making the contracts amount to $1,466,590 while the funds for the construction totaled $1,248,280. Consequently, $218,310 had to be taken from local sources in 1970.

Discontentment arose among the land owners in the county because many had experienced an increase in taxes as a result of the 1969 property re-evaluation. Some individuals reported sharp increases over the amounts they paid in 1968. The discontentment became intense and numerous law suits emerged protesting the property re-evaluation. In the case of Register et al. v. Langdale, Commissioner, et al., the Lowndes Superior Court declared the tax assessments for the 1969 tax digest unconstitutional and void. The court ruled that the personal property evaluations failed to be based on fair market value and that evaluations were not equitable between owners of real property and owners of personal property.

After analyzing the local situation relative to increased revenues for schools, the committee recommended an application for Title III, E.S.E.A. and E.S.A.P. funds so that IPI could be adopted in all of the elementary schools of the county. Title III, E.S.E.A. and E.S.A.P. sources granted the necessary funds for IPI Mathematics in all grades and IPI Reading in the upper elementary grades.

Having secured the approval of RBS officials, the schools made plans to begin the IPI program during the first month of the 1970-71 school year, but unfortunately a late arrival of materials from the publishers delayed the program. The schools initiated IPI Mathematics in October, 1970, and IPI Reading in December, 1970.

During the last months of the 1970-71 school year, school officials decided to implement an IPI Spelling program in grades one through six the following year. The IPI Spelling program began in September, 1971, and the IPI Mathematics continued in operation for the second year. IPI Reading continued for the second year, but the schools extended it to the lower elementary grades as well. Officials sought additional sources for funding the IPI program to continue the second year of operation. A compilation of Title III, E.S.A.P., I.A.P. along with other state and local funds made the second year of IPI a reality in Lowndes County.

CHAPTER TWO

PROGRAM

Originating from the theoretical work of Robert Glaser, the IPI program was designed to produce a systems approach to change within existing institutions. Its primary goal was to produce schools without student failure by providing learning materials which could meet each child's learning needs. A positive one to one relationship between teacher and pupil was an integral part of the approach to instruction. The program provided principal, teacher, and aide training in individualization for learning.

By creating a permissive learning environment, IPI maximized opportunities for self direction and independence. Because the program allowed for heterogeneous classrooms, students could experience social interactions with classmates who had different abilities, and, in addition, they could receive or give peer tutoring. In theory, affective development was a concomitant of the provisions in the program for cognitive development.

SCOPE OF THE PROGRAM

Number and Kinds of Participants Served

The implementation of Individually Prescribed Instruction in the five elementary schools of Lowndes County generated a curriculum designed to be responsive to the individual needs of ninety-six percent of a 3,280 total elementary student population. Even some students in special classes for the retarded worked with IPI materials during the second year of operation so that, with the exception of a very small percent, the entire student enrollment in grades one through six utilized this innovative individualized program for the academic areas of mathematics, reading, and spelling.

During the initiation of the program in Lowndes County, these five elementary schools served as part of the RBS national network of schools. During the first year of operation, federal grants made it possible to install IPI mathematics for all six grades and IPI reading for grades four, five, and six, and RBS classified the schools as participating schools in their network. In its second year of operation, the schools added IPI spelling in grades one through six and IPI reading in grades one through three; RBS classified the schools as national demonstration and training schools in their network.

Specific Objectives

According to the 1970-71 evaluation of the IPI program, Lowndes County schools achieved the initial objectives selected for the program during the first year of its operation. (Sharp and Neville, 1971) These objectives were the following:

1. To determine whether elementary school administrators can be effectively trained to implement the IPI program within their respective schools.
2. To determine whether elementary school administrators, once trained, can conduct an effective training program for teachers and teacher aides.
3. To determine whether an effective Individually Prescribed Instructional program can be implemented in Lowndes County in the areas of mathematics and reading during the 1970-71 school year.
4. To determine whether feedback through the monitoring system devised by Research for Better Schools will enable the Lowndes County Schools to make adjustment and improvements in the program.
5. To determine whether the district-wide approach to implementation of the IPI program has more advantages for Lowndes County than the one-school approach.

In the recommendations of their evaluation report, Sharp and Neville (1971) stated that the program achieved virtually all of the objectives originally set for it and recommended that new and more refined objectives be established for the program on the local level for the coming year. In response to this recommendation, the Board of Education adopted different objectives for the 1971-72 school year. These objectives are listed below.

1. To effectively maintain IPI mathematics in grades one through six.
2. To effectively maintain IPI Stage IV reading in grades four through six.
3. To effectively implement IPI primary reading in grades one through three.
4. To effectively implement IPI spelling in grades one through six.

PERSONNEL

Kinds and Numbers of Personnel Added

The instructional methods inherent in the IPI program required additional professional and paraprofessional personnel. To comply with differentiated staffing needs, the elementary schools employed seventeen floating teachers and forty-five teacher aides. The school system employed a director of evaluation with psychometric and research assistants, a project director with a secretary, and the five elementary principals for an additional month during the summer.

Major Duties and Activities

The principals in each elementary school modified their traditional roles so that they functioned through IPI duties and activities as instructional leaders and managers. The RBS Administrative Training Program provided the principals with special training for functioning in these roles. As instructional leaders, they trained teachers and teacher aides in the schools, observed and wrote prescriptions in the IPI classes, and conducted planning sessions with teachers. As managers of the IPI system, they scheduled classes, maintained IPI Material Centers, supervised school personnel, and provided for the parents information pertinent to IPI. The principals and assistant principals correlated these responsibilities with their traditional duties of building management, lunchroom supervision, bus supervision, behavioral referrals, coordination of special services, and record keeping.

The librarians functioned as both supervisors of the IPI Media Centers located in the libraries and as instructors in study skills. They taught students how to operate language masters and how to manipulate the audio cassette tape players.

Working as a team with the classroom teachers, the floating teachers instructed in IPI subjects full-time. Rather than being assigned to self-contained classrooms, these floating teachers moved from class to class throughout the day following the IPI schedule for each class in the building. They spent their time in these classes working with the classroom teacher evaluating the students' records, diagnosing their learning needs, writing prescriptions, and tutoring students on an individual basis.

The classroom teachers taught IPI subjects during specified periods and days each week. During these times they worked with the floating teachers evaluating student learning, diagnosing their learning problems, writing prescriptions, tutoring, grouping students for discussion, and initiating peer tutoring.

Assisting both the floating and the classroom teachers, the teacher aides spent their time in the critical areas of scoring tests, helping students locate appropriate materials from the IPI Material Centers in each school, and taking inventories of IPI materials for reordering purposes. These clerical duties necessitated interaction with students as well as with teachers. The aides performed their duties in the classrooms, in the halls, and in the IPI Material Centers.

Recruiting and Maintaining Staff Members

According to a poll of elementary principals, the Lowndes elementary schools encountered no special problems in recruiting professional and paraprofessional staff members. All principals reported an excess of applications for teaching positions and a waiting list of individuals seeking teacher aide positions. Various morale situations emerged during the training sessions and throughout the school year as teachers and teacher aides refined their methods of working with students on a individual basis. However, the principals used a diversity of techniques to maintain staff morale; consensus existed among the principals in the recognition of the need to sustain staff morale rather than in the selection of any one technique to be utilized in all schools.

PROCEDURES

Organizational Details

The evaluation period treated in this volume encompassed the second year, 1971-72, of a planned three-year program. To some degree, the initial planning stages as well as the first year implementation of IPI appeared evident in the product ensuing from these earlier efforts. The areas of reading, mathematics, and spelling constituted only a part of the total planned program of individualization. Plans have been made to add remaining subject areas to the program in future years.

The installation of IPI required some physical changes in the schools. For example, IPI Material Centers were constructed in storage rooms, and IPI Audio Rooms were installed in spare classrooms already existing in the building. Most of the activities involving the IPI program occurred in the elementary school buildings. These schools were Clyattville Elementary, Lake Park Elementary, Hahira Elementary, Parker Mathis Elementary, and Pine Grove Elementary. Planning, coordination, and evaluation activities occurred at the IPI Center in Westside School as well as in the various elementary school buildings.

The principals conducted pre- and post-school in-service training sessions for the teachers and teacher aides. Periodically throughout the school year, planned training sessions helped teachers refine their skills in prescription writing and interpersonal relations with students. Two weeks during each school month, an RBS consultant visited the elementary schools helping teachers with special problems and assisting the principals in assessing organizational behavior.

Activities

The major staff activities focused on the implementation of IPI. Research for Better Schools, Inc., in collaboration with the Learning Research and Development Center at the University of Pittsburgh, solely assumed responsibility for the developmental aspects of the program. However, as these agencies monitored the elementary schools in Lowndes County, the principals upon request made suggestions to the RBS consultant relative to the perfecting of the program in diverse settings.

Student behaviors revolved around three categories of activities, namely, test taking, completing prescriptions, and down time. Students utilized four types of diagnostic instruments:

Type I--Placement Tests measured mastery of units of work in the learning continuum of each subject area. They provided an indication of strengths and weaknesses in learning skills as well as graphed a profile of mastery of material for each student along the subject area continuum.

Type II--Pre--Tests assessed mastery of specific objectives and levels contained in the units of work. Because a pre-test existed for each unit and level of the subject continuum, teachers selected the appropriate pre-test for each student on the basis of his profile on the placement test.

Type III--Post--Tests, an alternate form of the pre-tests, measured mastery of objectives and levels within the units. Designed to be administered after completion of exercises for a specified set of objectives, it produced an indication of total intellectual growth within the levels of each unit when compared with pre-test scores.

Type IV--Curriculum--Embedded Tests evaluated the amount of student progress made toward a specified objective contained in each level and unit of work. Extrapolation of scores on this test provided data that served as a brief pre-test of readiness to encounter the next most difficult objective contained in the level and unit of the learning continuum.

Activities associated with completing a prescription required the students to follow instructions in their individual daily lesson plan. Classroom teachers, principals, assistant principals, and floating teachers wrote these instructions or prescriptions for each child on the basis of his performance on one of the four diagnostic tests. In completing the prescriptions, students engaged in a variety of behaviors including working practice exercises in Standard Teaching Sequence Booklets for each behavioral objective, reading books and library reference materials, listening to audio tapes, locating materials in various parts of the building, working in groups with peers, and tutoring peers.

Down time occurred when students temporarily stopped purposeful activity toward an academic objective. The general frequency of this event depended on the ability of the floating teachers and classroom teachers to move swiftly through the classroom tutoring students who indicated they needed help on an exercise by placing a colored flag on their desk tops. A second type of down time emerged when students were required to wait for teacher aides to score completed material or for teachers to write new prescriptions based on material scored by the teacher aides.

To ascertain an accounting of student time utilized by the IPI system per se, trained observers made systematic observations of twenty-four students selected at random from twelve randomly chosen classrooms within two schools, Pine Grove Elementary and Hahira Elementary. Using stopwatches during IPI periods, observers clocked the amount of time spent on "other activities." The latter, "other activities," included down time, location and retrieval of material from the IPI Material Centers, procurement and manipulation of mechanical devices for listening in the IPI Audio Rooms, and miscellaneous behaviors. The systematic observations occurred over a two week span of time on randomly chosen days of the week and randomly chosen IPI periods of the day. Observers found that students spent sixty-two percent of the IPI periods on subject matter learning and thirty-eight percent of the IPI periods on "other activities."

In general, schedules for IPI periods grew out of staffing characteristics, enrollment, and building space. IPI Audio Rooms exemplified this point in that space allowed only a limited number of students in these rooms at one time, and they required staff members for managing students and dispensing materials. The case was similar for the IPI Material Centers and the libraries. While no two schools followed the same schedule of academic periods, there was a great similarity among schools. Table 4 presents a typical weekly schedule of IPI subjects used during the 1971-72 school year by one of the elementary schools in Lowndes County. In addition to providing for IPI periods, it allocated time for teacher planning sessions as well. Some

TABLE 4

TYPICAL SCHEDULE IN AN IPI SCHOOL

Time	GRADES 1	2	3	4	5	6
8:20 - 8:44						
8:44 - 9:34			IPI MATH	IPI READING	IPI READING	
9:34 - 10:20	IPI READING			IPI READING	IPI READING	
10:20 - 10:40		IPI READING				
10:40 - 11:25			IPI READING			
11:25 - 12:05					IPI MATH	IPI READING
12:05 - 12:50		IPI SPELLING				IPI READING
12:50 - 1:30			IPI SPELLING			
1:30 - 2:15				IPI MATH		IPI MATH
2:15 - 3:00	IPI MATH	IPI MATH				
3:00 - 3:30						
3:30 - 3:40						

PLANNING PERIODS (TEACHERS)

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8:00 - 8:40		4th - 5th - 6th Reading & Spelling	4th Reading & Spelling	5th - 6th Reading & Spelling	4th Math
3:00 - 3:30	1st & 2nd Co-planning	5th & 6th Math	2nd & 3rd Math		
12:10 - 12:40				1st - Reading &Math 2nd & 3rd - Reading & Spelling	

school schedules allowed time each Friday for student seminars and group activities exclusively.

In terms of ability groups, a heterogeneous grouping pattern existed in all elementary schools. The classroom teachers ministered to the special needs of students with mental, emotional, or physical aberrations from the norm. Consultants from the Central Office Staff and from community agencies assisted the classroom teachers with difficult cases.

Because prescription sheets served as a record of scores on Type II Pre-Tests, Type III Post-Tests, Type IV Curriculum-Embedded Tests, and dates of prescriptions as well as their completion, students received tangible feedback daily on their individual progress through the learning continuum. Each student's profile sheet served as another means of feedback on learning. These profile sheets contained in pictorial form a square for each unit representing a concept area and level of that area. Upon mastery of each unit, the teacher wrote an "X" or the date of completion in the square. The schools provided each student with an IPI folder containing his prescription sheet and profile sheet along with an appropriate STS Booklet for his current prescription. Nonverbal and verbal cues emitted by the teacher in interpersonal relationships during tutoring served as additional feedback to the student.

Parents received reports on student progress via miniature profile sheets for each IPI subject area taught. Figure 1 shows sample report cards for IPI Reading, and Figure 2 shows sample report cards for IPI Mathematics and IPI Spelling. Reporting to parents at the conclusion of each six weeks period of the school year, teachers sent to the parents miniature profile sheets with a numeral placed in the squares for each unit mastered during the six weeks interval. These numbers represented the six weeks period in which the student mastered the units; e.g., if E Level fractions, money, and time were completed during the third six weeks period, then the number "3" would appear in the squares representing those units on the miniature profile sheets sent to parents. No letter grades were assigned to students for the IPI subjects. Parent Teacher Organization meetings held special programs with panel discussions on the IPI method of reporting student progress. Periodically, parent teacher conferences served to further familiarize parents with the IPI program and its effect on children.

Parent Community Involvement

A number of reporting methods used during the school year helped to inform the public about the IPI program. Newspaper articles which described various aspects of the program appeared in the local newspaper periodically. WPOL in Atlanta, Georgia, and WGTV presented documentaries on IPI. Each of the elementary schools held open house in the fall, and further, over three hundred invited guests made tours of these schools in the course of the year. The parents of each elementary

SAMPLE REPORT CARD FOR IPI READING

IPI Reading Stages I, II, and III

Each blank in the continuum represents a unit of work, which is made up of several skills. A shaded blank indicates no unit at that level. X in a blank means that your child has previously mastered that unit, either last year or as shown by placement tests. 1 indicates that unit was completed during the first six weeks period of school. 2 means it was completed during the second six weeks, etc.

STAGE I

Readiness Book _____

Pre-Reading _____

STAGE II

Book 1 _____
Book 1A _____
Book 2 _____
Book 3 _____
Book 4 _____
Book 5 _____
Book 6 _____
Book 7 _____
Book 8 _____
Book 9 _____
Book 10 _____
Book 11 _____
Book 12 _____
Book 13 _____
Book 14 _____

STAGE III

Book 15 _____
Book 16 _____
Book 17 _____
Book 18 _____
Book 19 _____
Book 20 _____

NUMBER OF STORY BOOKS READ

First Period _____
Second Period _____
Third Period _____
Fourth Period _____
Fifth Period _____
Sixth Period _____

IPI Reading, Stage IV

LEVEL	E	F	G	H	I	J	K	
Structural Analysis								
Vocabulary Development								
Literal Comprehension								
Evaluative Comprehension								
Library Skills								
Reference Skills								
Organizational Skills								

Figure 1.

SAMPLE REPORT CARDS FOR IPI SPELLING AND IPI MATHEMATICS

IPI Spelling Book B C D E F (Circle)

Half Book	_____	Half Book	_____
Level	_____	Level	_____
List 1	_____	List 1	_____
List 2	_____	List 2	_____
List 3	_____	List 3	_____
List 4	_____	List 4	_____
List 5	_____	List 5	_____
Half Book	_____	Half Book	_____
Level	_____	Level	_____
List 1	_____	List 1	_____
List 2	_____	List 2	_____
List 3	_____	List 3	_____
List 4	_____	List 4	_____
List 5	_____	List 5	_____
Half Book	_____	Half Book	_____
Level	_____	Level	_____
List 1	_____	List 1	_____
List 2	_____	List 2	_____
List 3	_____	List 3	_____
List 4	_____	List 4	_____
List 5	_____	List 5	_____

IPI Mathematics

Each blank in the continuum represents a unit or work, which is made up of several skills. A shaded blank indicates no unit at that level. X in a blank means that your child has previously mastered that unit, either last year or as shown by placement tests. 1 indicates that unit was completed during the first six weeks period of school. 2 means it was completed during the second six weeks, etc.

LEVEL	A	B	C	D	E	F	G
Numeration							
Place Value							
Numeration/ Place Value							
Addition							
Subtraction							
Addition/ Subtraction							
Multiplication							
Division							
Combination of Processes							
Fractions							
Money							
Time							
Systems of Measurement							
Geometry							
Applications or Special Topics							

Figure 2.

student enrolled in the county received an informative letter on IPI from the superintendent of schools. Appendix A contains the full text of this letter.

An ESAP Advisory Committee met once a month during the year to discuss the IPI program. The committee consisted of seven Negro and seven Caucasian members from the community; among these were four parents of elementary students, a representative from the local National Association for the Advancement of Colored People, a representative of the Office of Economic Opportunity, the Administrator of the Georgia Sheriffs' Boys Ranch, a representative from the Hahira Lions Club, a member of a local Parent Teacher Organization, two members of the local Title I Advisory Committee, the Director of the Lowndes County Health Department, and the county coordinator of projects. The committee invited a group of school administrators and teachers to attend some of the meetings.

Program Equipment and Material

The IPI program required a considerable amount of equipment to be purchased. During the 1971-72 academic year, the schools bought 361 audio cassette pacers, 11,868 cassettes, 5 cassette filing cabinets, 34 extra earphones for the pacers, and building material for constructing IPI Audio Rooms. In addition to material on hand from the first year of the IPI operation, the county bought 8,112 selected reading books, complete printed material for Stages I, II, and III Reading in IPI, 14,570 program reading booklets, 16,750 tapebooks, 1,400 storybooks, and 2 films. Approximately 700 large boxes of material arrived at the IPI Center via mail and subsequently were dispersed to the 5 elementary schools. Some of these included stationary supplies as well as the published IPI materials and specially constructed equipment for the program. The audio cassette pacers were the only materials which proved defective. Many of these pacers had to be returned to the manufacturer to be repaired after being in use only a short time.

BUDGET

Table 5 presents the complete budget approved for the second year of the program. Several funding agencies contributed to the total expenditures for the second year of IPI. When the budgets for the 1970-71 year and the 1971-72 year are compared, the most obvious change in budget allocations was in the area of local funding which increased for the second year of the program in compliance with the Title III grant requirements.

TABLE 5

1971-72 BUDGET SHOWING IMPLEMENTATION COSTS OF IPI MATHEMATICS, IPI READING, AND IPI SPELLING IN THE LOWNDES COUNTY ELEMENTARY SCHOOLS

EXPENSE CLASSIFICATION		Project Time-%	No.	Unit Salary or Cost	Total Budgeted Amount	SOURCE OF FUNDS				M. F. P. E
						Contributing Agencies		Federal Programs		
						L. E. A.	State	Title III	E. S. A. P.	
no. 100:	Administration	Full	2	17,028	17,028			17,028		
	Elementary Principals	50%	5	6,605	33,025	3,625				29,400
	Elementary Asst. Principals	40%	5	3,604	18,020	2,000				16,020
	Supplies				600	600				
no. 200:	Evaluation				18,400	1,400		17,000		
	Salaries for Floating Teachers	Full	17	6,804	115,668	74,844			40,824	
	Salaries for Teachers	30%	122	2,041	249,002	17,166				231,836
	Salaries for Teachers	40%	5	3,600	18,000	400				17,600
	Teacher Aides Salaries	Full	45	2,400	108,000	2,400	16,800 (IAP)	88,800		
	IPI Math, 3400 Students				34,000	34,000				
	IPI Stage IV Reading				17,174	17,174				
	Selected Reading				12,998			12,998		
	IPI Primary Reading				71,811		13,365 (texts)	58,446		
	IPI Spelling				12,532		6,900	7,783		
	Pre-service Training $15/day				12,690			12,690		
	IPI Training Material ($10)		156	10	1,560			1,560		
no. 600:	Operation of Plant		1		960	960				
no. 800:	Fixed Charges									
	Social Security ($99,600)				5,575			5,575		
	Teacher's Retirement ($23,228)				1,777			1,777		
	Social Security ($460,115)				29,147	29,147				
	Teacher's Ret. ($433,715)				33,286	33,286				
no. 1230:	Capital Outlay-Tape units		361	20	28,880	21,880				7,000
	TOTAL				840,133	238,882	37,065	223,657	40,824	301,856

CHAPTER THREE

EVALUATION

A multidimensional method of evaluation was utilized in conducting the study. Various evaluation techniques were employed in assessing selected areas of the cognitive and affective domains related to the priority needs and objectives of the program. These techniques included standardized tests, systematic classroom observations, interviews, and opinion polls, along with some unobtrusive measures. To foster a clear understanding of the research methodology, this chapter discusses the scope of the evaluation, the objectives and rationales, a description of the participants along with selection methods, and a description of measurements. A presentation of the data and results of the statistical analyses accompany a narrative interpretation. Statistical analyses range from simple to complex and require varying degrees of sophistication on the part of the reader. Most of the information in this chapter should be understandable to the large majority of individuals for whom the research is pertinent.

SCOPE OF THE EVALUATION

This study was designed to be essentially a product evaluation. Emphasis has been placed on what the program produced rather than on processes per se. The data gathered supplies information on student changes in achievement, interest in school, and attention to task as well as system changes in the areas of teacher morale, psychoeducational referrals, discipline referrals, and summary IPI profiles. The opinions of migrant students and parents of IPI students were studied as well. Several tangential studies were conducted for supportive purposes, e.g., a content validity study and systematic observations to clock categories of behaviors within an IPI period. Since the areas of creativity and personality change were investigated extensively in the evaluation of the first year of the program, they were not included in the scope of this evaluation.

OBJECTIVES AND RATIONALE

The general program objectives adopted by the Lowndes County Board of Education for the 1971-72 year of IPI are listed below:

1. To effectively maintain IPI mathematics in grades one through six.
2. To effectively maintain IPI Stage IV reading in grades four through six.
3. To effectively implement IPI primary reading in grades one through three.
4. To effectively implement IPI spelling in grades one through six.

These general objectives were selected on the assumption that the high priority needs of the schools would be gratified if the general objectives for the program were met. The high priority needs are listed in Chapter Two.

PARTICIPANTS

The participants in the IPI program included all elementary students not in retarded classes, all elementary teacher aides, all elementary teachers, and all elementary administrators in the Lowndes County Schools. In collecting data from students and teachers, the evaluator employed random sampling from two schools in Lowndes County labeled experimental schools and three schools in nearby counties labeled control schools. These schools were selected during the first year of the

program by Sharp and Neville (1971) on the basis of several criteria, and in their evaluation report they explain the process.

> ... The two schools selected in Lowndes County were, in the opinion of the evaluators and several consultants, most representative of all the schools. The two schools selected to serve as the experimental schools were Hahira Elementary School and Pine Grove Elementary School.
>
> For the purpose of comparison, two control schools were selected. The control schools were chosen from nearby counties and they were matched as much as possible with the two schools in Lowndes County on the basis of size, parental occupation, percentage of rural students, ratio of black students to white students, and student intelligence test scores. (p. 42)

A stratified random sample of 260 students was drawn from the experimental schools, and an equivalent random sample was drawn from the control schools for comparing IPI and Non-IPI programs. A blanket sample of 254 students within one grade in the experimental schools was used in comparing achievement for two races within the IPI program. The students in these original samples ranged in age from six to fourteen years. The distribution of males and females was approximately equal. Most of the students came from families engaged in blue collar, white collar, military, and farming occupations. All of the students fell within or above the average range of intelligence. Approximately seventy percent of the students were Caucasian and twenty-nine percent were Negro. No students from mentally retarded classes were in the populations from which the original samples were drawn.

For measuring achievement, random samples from grades two, three, and five were used. The third and fifth grade random samples were the same subjects chosen for the 1971 evaluation study. In assessing school interest for graduating elementary students, a random sample of sixth grade students was drawn during the final days of the academic year. Sixth grade students were appropriate, in part, because of the nature of the instrument used for measuring school interest. Since the Statewide Testing Program of Georgia yielded achievement test scores for all students in the fourth grade within the two experimental schools, those fourth grade students who took the statewide tests became subjects for comparing differences in achievement by race. This blanket testing in the fourth grade gave a sufficiently high number of subjects to make possible this comparison within the two experimental schools. For systematic observations of on-task off-task behaviors, classrooms were randomly selected within one of the experimental schools.

MEASUREMENT OF CHANGES

Changes in Students

The four objectives of the program stated that IPI Reading, IPI Mathematics, and IPI Spelling would be effectively implemented and maintained by the elementary schools. These objectives were based on recognized needs for equality of educational opportunity, self-determination, and educational accountability. The program was implemented and maintained as certified by observations during the year. That is to say, IPI teaching materials, training sessions, and teaching methods were operative. The relative degree and quality of effective implementation and maintenance of the program can be perceived by professional educators in a more meaningful way by a variety of measures designed to assess different dimensions of behavior within students who experienced the program. To make this kind of evaluation, a comprehensive series of standardized achievement tests, an interest inventory, and intelligence tests were selected for measuring instruments.

Mathematics achievement was measured in the experimental and control schools with the 1970 edition of the California Mathematics Achievement Test (Math CAT). Tested during October of 1970 and again in April of 1972, students in the third and fifth grades were given alternate Forms A and B of Level Two and Level Three respectively. Second grade students were administered Form B of Level Two during April of 1972.

The Reading Vocabulary Test and the Reading Comprehension Test of the Comprehensive Tests of Basic Skills (Reading CTBS) were administered to students in experimental and control schools to measure reading achievement. Third and fifth grade students were given alternately Form Q and Form R of Level One and Level Two during October of 1970 and again in April of 1972. Form Q of Level Two was administered to the second grade students during April of 1972.

Since a considerable amount of library work was part of the IPI Reading program, the Study Skills Test of the Comprehensive Test of Basic Skills (Study Skills CTBS) was used to measure achievement in study skills in the experimental and control schools. During October of 1970 and again in April of 1972, third and fifth grade students were given Level One and Level Two respectively using Form Q and Form R alternately. Second grade students took Form Q of Level One in April of 1972.

To measure spelling achievement, grades three and five in the experimental and control schools were given the Spelling Test of the Comprehensive Test of Basic Skills (Spelling CTBS) during April of 1971 and again during April of 1972. Form Q and Form R of Level One and Level Two were used alternately at these two times. Form Q of Level

One was administered to the second grade in April of 1972.

Each of these achievement tests was a standardized instrument which was written for and normed on a national sampling of students most of whom were in Non-IPI schools. While the above process would make these achievement tests appropriate for the control schools, the appropriateness of these tests for IPI students seemed unanswered without a validity study. Such a study was conducted. The eight floating teachers in the experimental schools received from the evaluator a copy of Levels One and Two of the 1970 Math CAT, the Reading CTBS, the Study Skills CTBS, and the Spelling CTBS. At the same time, the evaluator gave the following instructions to the floating teachers:

> Please take a few minutes of your time to help in a validity study for the achievement tests I have just given to you. For each level of the tests in mathematics, reading, study skills, and spelling, place an "X" by the test items which you feel are representative of the curriculum in each subject area of the IPI continuums taught in your school.

Table 6 shows the percent of items on each level of the four achievement tests representing the curriculum of the IPI continuums as marked by the floating teachers. The teachers marked at least ninety-seven percent of the items on all of the achievement tests as representative of the curriculum of the IPI continuum and one hundred percent of the items were marked on most of the tests. After completion of the instructions to mark representative items on the tests, the teachers were asked the following question verbally: "Now that you have completed your analysis of these tests, what areas of the IPI continuum were not covered or were not represented on these tests?" Five of the eight floating teachers responded that creative writing was the only area not covered on the achievement tests, and three answered that the area of systems of measurement in the IPI Math continuum was the only area not represented adequately. This study supplies evidence of content validity for these four achievement tests for use with IPI students.

In October of 1971, Georgia students in the fourth grade took the Iowa Test of Basic Skills (ITBS) as provided by state law. All of the fourth grade students in the experimental schools, excluding students in mentally retarded classes, were among those in the State of Georgia who were administered Form Five, Level B of the ITBS. This achievement test yielded scores in the areas of reading, vocabulary, mathematics, work-study skills, and language skills. The ITBS has high test-retest reliability. It has a considerable amount of predictive and content validity. (Buros, 1965) Currently, it is in constant use in comparing school systems, programs, and student groups within the state. The scores of Caucasian and Negro students were compiled to

TABLE 6

PERCENTAGE OF MATH CAT ITEMS AND CTBS ITEMS REPRESENTING THE READING, SPELLING, AND STUDY SKILLS CURRICULA IN THE EXPERIMENTAL SCHOOLS

Test	Percent
Study Skills	
Level 1	100.0
Level 2	100.0
Spelling	
Level 1	100.0
Level 2	100.0
Reading	
Level 1	98.9
Level 2	100.0
Math	
Level 1	98.9
Level 2	97.6

further evaluate the effectiveness of the IPI program in meeting high priority need number one, equality of educational opportunity.

To aid in the statistical analysis of the achievement scores, three group tests of mental ability were utilized. Fifth grade students in the experimental and control schools completed Level Two of the California Short- Form Test of Academic Aptitude in April of 1971. Second and third grade students in the experimental and control schools took Level One and Level One-H of the California Short-Form Test of Mental Maturity during April of 1972. These two mental ability tests facilitated analysis of Math CAT, Reading CTBS, Spelling CTBS, and Study Skills CTBS scores. Fourth grade students in the experimental schools completed the Cognitive Abilities Test in October of 1971. This test helped in the analysis of the ITBS scores.

Another dimension of the effectiveness of the IPI program was student interest in school. This dimension related to high priority need number one, self- determination, and it related to high priority need number five, educational accountability. To predict those students most likely to remain in school and those most likely to drop out of school, Cottle's School Interest Inventory (SII) was selected. Designed to detect and predict potential school dropouts, the instrument has high test-retest reliability and predictive validity. (Cottle, 1966) The SII was administered to sixth grade students in the experimental and control schools during the last weeks of May in 1972.

To determine the effectiveness of the IPI program in relation to high priority need number three, congruence of instructional theory with practice, systematic classroom observations were conducted by two observers over a thirty day period of time during March of 1972. Designed to measure the influence individualized instruction had on attention to task in the classroom, the observations were conducted by trained observers who employed the Madsen and Madsen (1970) Group On-Task Off-Task Observation Method. The two observers made the observations in five randomly selected classrooms from one of the experimental schools. Days and class periods for the observations were selected randomly. Over 2,642 ten-second group on-task off-task classroom observations were made during IPI periods and an equal number were conducted on the same students in the same classrooms during Non-IPI periods. The ten-second observations were made consecutively for fifteen minute blocks of time per period. The on-task off-task criteria were based on each teacher's rules for his class during IPI and Non-IPI periods. Appendix B contains samples of these rules given to the observers by the teachers of the five classrooms selected at random.

All of the tests given to students were administered by trained psychometric assistants most of whom were students at Valdosta State College and some of whom were retired or substitute teachers from the

Valdosta area. These individuals received training sessions from the evaluator preceding the testing periods. The testers followed the instructions provided by the manual for each test explicitly during the testing sessions. In a similar manner, the evaluator trained the two observers preceding the observation month. One observer was a senior psychology major and the other was a recent graduate of Valdosta State College.

Seeking to meet high priority need number one, equality of educational opportunity, the IPI schools incorporated the migrant program into the regular classroom activities. The fifty migrant students who experienced IPI during the 1971-72 school year were interviewed by the migrant social worker to determine the feelings of these students toward the IPI program and its influence on their attitudes toward school. Each of these individual interviews occurred at the termination of the student's enrollment in the school system because his parents were moving or at the conclusion of school for those students remaining in the school system.

Changes in the System

Based on the assumption that teacher morale can influence the quality and degree of effective implementation and maintenance of an instructional program, a system-wide study of teacher morale was conducted in the experimental and control counties. For measuring purposes, the Purdue Teacher Opinionaire (PTO) was administered to elementary teachers in the experimental and control counties on a day randomly chosen from all of the school days of the 1971-72 school year. The Purdue Teacher Opinionaire is a standardized instrument designed to measure teacher morale. It has a test-retest reliability correlation of .87 for total scores. In addition, several kinds of validity are reported in the manual. (Bently, 1970)

Descriptive information derived from school records provided another dimension to the study of changes in the system. Records of psychoeducational referrals to the social workers by the elementary classroom teachers and principals in Lowndes County were compiled for the 1971-72 school year. In addition, principals in the experimental and control schools kept monthly records of discipline problems referred to them by classroom teachers. The IPI program provided reading and math summary profile charts for all of the students in the experimental schools for the 1970-71 and 1971-72 school years. The profiles show how many students had completed each level of the IPI continuum at the conclusion of school. These levels of each area of mathematics and reading are in no way equal in number of objectives, skills to be learned, or test items to be passed. However, they provide in graphic form where students placed in the IPI continuum at the conclusion of school. The profiles served as descriptive data.

Parent Opinion

To account for parental receptivity of the IPI program, an opinion poll was conducted. Twenty percent of the parents of elementary school students in Lowndes County were randomly selected for the poll. It was designed to gather information on parental feeling toward various aspects of the IPI program. The poll was conducted by mail using 661 parents who were the twenty percent sample selected at random. A second copy of the opinion poll was sent by mail to parents who did not return the first one making possible an eighty-one percent return.

PRESENTATION AND ANALYSIS OF THE DATA

Several kinds of statistical tests were used in analyzing the data. For this purpose, the Control Data Corporation (CDC) 6500 Computer System at Florida State University was utilized. For some of the data, calculations of percentages and sums were appropriate. Flow charts, school records, and opinion polls are examples of data tabulated by hand.

Achievement

To analyze the achievement scores for grades two, three, four, and five, a 2 X 2 factorial analysis of covariance was made using the general linear model. The two independent variables for grades two, three, and five were sex (male vs. female) and treatment (IPI vs. Non-IPI). The California Short-Form Test of Mental Ability was used as the covariate for Math CAT scores as well as reading, study skills, and spelling scores of the CTBS for the second grade students. Table 7 shows the F-Ratios from the analysis of covariance for the four dependent variables used to measure achievement, mathematics, reading, study skills, and spelling in grade two. For the mathematics scores, the sex effect and treatment effect were not significant at the .05 level. However, the interaction effect was significant at the .05 level. An inspection of the adjusted means in Table 8 shows that control males scored significantly higher on mathematics than experimental males and experimental females were somewhat higher than control females. An examination of the F-Ratios for reading in Table 7 reveals a significant sex and treatment effect at the .01 level, but the interaction effect did not reach significance at the .05 level. The adjusted means for Reading CTBS scores in Table 9 show that females scored significantly higher than males in both the experimental and control schools and that experimental students scored significantly higher than control students in reading. The F-Ratios in Table 7 for study skills scores show a significant sex effect at the .01 level but failed to show a significant treatment or interaction effect. The adjusted means for study skills listed in Table 10 reveal that females scored significantly higher than males in the experimental and control schools. Finally, the second grade F-Ratios for spelling show a highly significant

sex effect at the .01 level of confidence and a significant treatment effect at the .01 level. No significant interaction effect was reached at or beyond the .05 level. The adjusted means in Table 11 for spelling show that females scored significantly higher than males and that experimental students scored higher than control students. Based on the results from the statistical analysis of the achievement data, the sex effect was statistically significant in three areas, reading, study skills, and spelling. A significant treatment effect occurred only in two areas, reading and spelling. An interaction effect between sex and treatment occurred only in the area of mathematics. IPI students scored significantly higher than control students in two achievement areas, spelling and reading. For mathematics, control males scored significantly higher than experimental males.

TABLE 7

F-RATIOS FOR SEX BY TREATMENT WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR FOUR DEPENDENT VARIABLES FOR SECOND GRADE STUDENTS

Source of Variation	Dependent Variable			
	Math	Reading	Study Skills	Spelling
Sex (S)	2.79	9.07*	7.50*	36.14*
Treatment (T)	2.92	6.20*	2.01	8.70*
S X T	5.36*	.92	.008	2.84
Covariate	65.07**	68.19**	68.73**	59.53**

*$p < .05$
**$p < .01$

TABLE 8

MEANS FOR SEX BY TREATMENT WITH MENTAL ABILITY SCORES AS THE COVARIATE WITH MATH CAT SCORES AS THE DEPENDENT VARIABLE FOR SECOND GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	40.87	70.44	- 4.21	48.62	72.10	2.48
Female	47.68	70.75	2.40	48.18	73.09	1.41

Regression Coefficient = .64

TABLE 9

MEANS FOR SEX BY TREATMENT WITH MENTAL ABILITY SCORES AS THE COVARIATE WITH READING CTBS SCORES AS THE DEPENDENT VARIABLE FOR SECOND GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	29.06	70.44	- 20.95	27.46	72.10	- 23.73
Female	36.43	70.75	- 13.80	31.86	73.09	- 20.03

Regression Coefficient = .71

TABLE 10

MEANS FOR SEX BY TREATMENT WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR STUDY SKILLS CTBS SCORES AS THE DEPENDENT VARIABLE FOR SECOND GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	10.59	70.44	-5.61	10.10	72.10	-6.48
Female	12.17	70.75	-4.10	11.93	73.09	-4.88

*Regression Coefficient = .23

TABLE 11

MEANS FOR SEX BY TREATMENT WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR SPELLING CTBS SCORES AS THE DEPENDENT VARIABLE FOR SECOND GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	9.73	70.44	-11.40	9.18	72.10	-12.45
Female	16.21	70.75	- 5.01	13.07	73.09	- 8.85

*Regression Coefficient = .30

For the third grade scores, Math CAT, Reading CTBS, Study Skills CTBS, and Spelling CTBS pretest scores were used as the covariate in making the 2 X 2 factorial analysis of covariance. F-Ratios for third grade achievement scores in mathematics, reading, study skills, and spelling are presented in Table 12. For mathematics achievement, the F-Ratios show there was no significant sex effect, treatment effect, and interaction effect at or beyond the .05 level of confidence. This means that neither males nor females scored significantly different from each other on mathematics and that neither experimental nor control students scored significantly different from each other. The interaction between sex and treatment did not reach significance at or beyond the .05 level.

TABLE 12

F-RATIOS FOR SEX BY TREATMENT WITH PRETEST ACHIEVEMENT SCORES AS THE COVARIATE FOR FOUR DEPENDENT VARIABLES FOR THIRD GRADE STUDENTS

Source of Variation	Dependent Variable			
	Math	Reading	Study Skills	Spelling
Sex (S)	.29	2.14	.16	2.47
Treatment (T)	.002	1.99	2.38	.21
S X T	.91	.42	.003	.001
Covariate	12. 95**	16. 04**	59. 99**	73. 78**

* p<.05
** p<.01

Table 13 contains the third grade adjusted means along with the covariate means and raw means for mathematics scores. In the area of reading for third grade students, the sex effect, treatment effect, and interaction effect all failed to reach significance at the .05 level of confidence. That is to say, there was no significant difference in reading scores between males and females; similarly, there was no significant difference between experimental and control students in reading. No significant interaction between sex and treatment occurred. Table 14 presents the adjusted means, covariate means, and raw means for reading. The F-Ratios for study skills contained in Table 12 show that no significance at the .05 level was reached for the sex effect, treatment effect, and interaction effect. Neither males nor females scored significantly different from each other; neither the experimental students nor the control students scored significantly different from each other. No significant interaction between sex and treatment appeared. Table 15 contains the adjusted means, covariate means, and raw means for study skills. Finally, inspection of the F-Ratios for spelling in Table 12 reveals no significant interaction at the .05 level for the sex effect, treatment effect, and interaction effect. Again, this means that males and females did not score significantly different on spelling and that there was no significant difference between the scores of experimental and control students. No significant interaction between sex and treatment occurred. Table 16 presents the adjusted means, the covariate means, and the raw means for the spelling scores. The statistical analysis of the data from these third grade scores reveals that they failed to demonstrate a significant difference at or beyond the .05 level for any of the sources of variation. A perusal of Table 12 shows how small most of the F-Ratios were. Very few even approached significance. None of the F-Ratios for mathematics, reading, study skills, and spelling reached significance at or beyond the .05 level of confidence for either the sex effect, treatment effect, or interaction effect.

For the 2 X 2 analysis of covariance on the fifth grade scores, the pretest scores of the Math CAT, Reading CTBS, Study Skills CTBS, and Spelling CTBS were used as the covariate. The F-Ratios for the fifth grade scores in the areas of mathematics, reading, study skills, and spelling are presented in Table 17. An examination of the F-Ratios for the area of mathematics shows there was no significant treatment effect at the .05 level. However, there was a significant sex effect at the .05 level. The interaction effect between sex and treatment failed to reach significance at or beyond the .05 level. An investigation of the adjusted means in Table 18 shows that females scored significantly higher

TABLE 13

MEANS FOR SEX BY TREATMENT WITH PRETEST ACHIEVEMENT SCORES AS THE COVARIATE FOR MATH CAT SCORES FOR THIRD GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	62.10	43.00	42.32	59.29	33.20	44.02
Female	65.14	41.25	46.17	57.03	37.57	39.75

* *Regression Coefficient = .46*

TABLE 14

MEANS FOR SEX BY TREATMENT WITH PRETEST ACHIEVEMENT SCORES AS THE COVARIATE FOR READING CTBS SCORES FOR THIRD GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	39.45	22.05	18.95	34.29	19.25	16.39
Female	43.85	19.00	26.18	39.53	21.96	19.11

*Regression Coefficient = .93

TABLE 15

MEANS FOR SEX BY TREATMENT WITH PRETEST ACHIEVEMENT SCORES AS THE COVARIATE FOR STUDY SKILLS CTBS SCORES FOR THIRD GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	13.40	39.85	2.25	13.54	34.08	4.00
Female	14.40	41.59	2.76	14.73	36.92	4.40

*Regression Coefficient = .28

TABLE 16

MEANS FOR SEX BY TREATMENT WITH PRETEST ACHIEVEMENT SCORES AS THE COVARIATE FOR SPELLING CTBS SCORES FOR THIRD GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	15.30	27.80	5.02	12.70	22.33	4.44
Female	18.59	31.40	6.98	15.34	24.46	6.29

*Regression Coefficient = .37

than males in mathematics. There was no significant difference in the scores for experimental students and control students, and interaction between sex and treatment failed to reach significance. In the area of reading, the treatment effect and interaction effect failed to reach significance. However, there was a significant sex effect at the .01 level of confidence. An examination of the adjusted means in Table 19 shows that female students scored significantly higher than male students in reading. The F-Ratios for study skills show neither a significant treatment effect nor a significant interaction effect, but there was a significant sex effect at the .01 level. Table 20 shows the adjusted means for study skills. A perusal of these reveals that female students scored significantly higher than the male students. The F-Ratios for spelling show no significant effects for either sex, treatment, or interaction. This means that the scores for males and females were not significantly different. Scores for experimental and control students were not significantly different, and interaction scores between sex and treatment did not reach significance. The adjusted means, covariate means, and raw means for spelling are presented in Table 21. The statistical analysis of fifth grade scores demonstrates that the treatment effect failed to be significant at the .05 level for mathematics, reading, study skills, and spelling achievement areas. However, significance was reached at the .05 level in the area of mathematics and at the .01 level for reading and study skills. Female students scored significantly higher than male students in mathematics, reading, and study skills.

TABLE 17

F-RATIOS FOR SEX BY TREATMENT WITH PRETEST ACHIEVEMENT SCORES AS THE COVARIATE FOR FOUR DEPENDENT VARIABLES FOR FIFTH GRADE STUDENTS

Source of Variation	Dependent Variable			
	Math	Reading	Study Skills	Spelling
Sex (S)	5.68*	8.39	7.52	.31
Treatment (T)	1.39	.39	.002	2.37
S X T	.01	.06	.13	1.68
Covariate	77.73	107.05	31.19	151.44

*p<.05
**p<.01

TABLE 18

MEANS FOR SEX BY TREATMENT WITH PRETEST ACHIEVEMENT SCORES AS THE COVARIATE FOR MATH CAT SCORES OF FIFTH GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	39.03	74.71	7.66	39.88	72.92	9.26
Female	48.11	83.23	13.16	46.55	82.34	11.97

*Regression Coefficient = .42

TABLE 19

MEANS FOR SEX BY TREATMENT WITH PRETEST ACHIEVEMENT SCORES AS THE COVARIATE FOR READING CTBS SCORES OF FIFTH GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	35.53	27.64	7.62	32.40	31.03	1.06
Female	46.61	25.48	20.88	41.13	27.72	13.14

*Regression Coefficient = 1.01

TABLE 20

MEANS FOR SEX BY TREATMENT WITH PRETEST ACHIEVEMENT SCORES AS THE COVARIATE FOR STUDY SKILLS CTBS SCORES OF FIFTH GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	20.64	14.21	11.27	19.70	13.59	10.74
Female	26.50	16.88	15.36	25.13	13.75	16.06

*Regression Coefficient = .66

TABLE 21

MEANS FOR SEX BY TREATMENT WITH PRETEST ACHIEVEMENT SCORES AS THE COVARIATE FOR SPELLING CTBS SCORES OF FIFTH GRADE STUDENTS

SEX	Treatment					
	Experimental			Control		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	14.39	34.67	2.61	13.03	28.96	3.19
Female	20.88	46.26	5.16	17.48	40.96	3.56

*Regression Coefficient = .34

TABLE 22

F-RATIOS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS A COVARIATE FOR ELEVEN DEPENDENT VARIABLES OF THE ITBS FOR FOURTH GRADE STUDENTS

Source of Variation	Dependent Variables***										
	M1	M2	V	R	L1	L2	L3	L4	W1	W2	W3
Sex (S)	1.37	2.92	.18	.52	1.22	2.03	2.49	1.43	.96	.006	.42
Race (R)	2.46	.76	.0003	.29	1.11	.01	.95	.41	.33	1.29	3.68
S X R	.26	.72	2.14	1.07	.12	.10	.36	.61	1.66	1.17	.43
Covariate	222.50**	166.10**	258.50**	304.15**	238.97**	126.66**	126.91**	174.38**	170.82**	107.59**	166.43**

*$p < .05$
**$p < .01$

*** *M1 = Math Concepts*
M2 = Math Problems
V = Vocabulary
R = Reading
L1 = Spelling
L2 = Capitalization

*** *L3 = Punctuation*
L4 = Language Usage
W1 = Maps
W2 = Graphs
W3 = References

TABLE 23

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR VOCABULARY ITBS SCORES OF EXPERIMENTAL FOURTH GRADE STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	13.93	45.01	.88	10.30	28.72	1.98
Female	16.76	52.46	1.55	10.72	34.75	.65

*Regression Coefficient = .29

TABLE 24

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR READING ITBS SCORES OF EXPERIMENTAL FOURTH GRADE STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	24.28	45.01	4.48	17.51	28.72	4.88
Female	27.88	52.46	4.80	18.44	34.75	3.15

*Regression Coefficient = .44

TABLE 25

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR SPELLING ITBS SCORES FOR FOURTH GRADE EXPERIMENTAL STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	12.71	45.01	-.34	9.06	28.72	.74
Female	15.95	52.46	.74	11.37	34.75	1.30

*Regression Coefficient = .29

TABLE 26

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR CAPITALIZATION ITBS SCORES FOR FOURTH GRADE EXPERIMENTAL STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	14.00	45.01	5.45	11.18	28.72	5.73
Female	16.58	52.46	6.62	13.06	34.75	6.46

*Regression Coefficient = .19

TABLE 2 7

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR PUNCTUATION ITBS SCORES FOR FOURTH GRADE EXPERIMENTAL STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	12.20	45.01	2.75	9.96	28.72	3.93
Female	15.37	52.46	4.36	11.96	34.75	4.67

*Regression Coefficient = .21

TABLE 28

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR LANGUAGE USAGE ITBS SCORES FOR FOURTH GRADE EXPERIMENTAL STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	11.68	45.01	2.23	9.06	28.72	3.03
Female	13.05	52.47	2.04	9.10	34.76	1.81

*Regression Coefficient = .21

TABLE 29

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR WORK–STUDY SKILLS IN MAPS ITBS SCORES FOR FOURTH GRADE EXPERIMENTAL STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	11.88	45.01	3.78	8.51	28.72	3.35
Female	12.02	52.46	2.58	9.79	34.75	3.44

Regression Coefficient = .18

TABLE 30

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR WORK–STUDY SKILLS IN GRAPHS ITBS SCORES FOR FOURTH GRADE EXPERIMENTAL STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	8.31	45.01	3.36	6.48	28.72	3.33
Female	8.74	52.46	2.97	7.68	34.75	3.86

Regression Coefficient = .11

TABLE 31

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR ITBS SCORES FOR WORK–STUDY SKILLS IN REFERENCES FOR FOURTH GRADE EXPERIMENTAL STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	17.66	45.01	6.86	15.69	28.72	8.80
Female	20.44	52.46	7.85	17.17	34.75	8.83

*Regression Coefficient = .24

TABLE 32

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR ITBS MATHEMATICS CONCEPTS SCORES FOR FOURTH GRADE EXPERIMENTAL STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	12.68	45.01	2.78	9.66	28.72	3.35
Female	13.39	52.46	1.85	10.65	34.75	3.01

*Regression Coefficient = .22

TABLE 33

MEANS FOR SEX BY RACE WITH MENTAL ABILITY SCORES AS THE COVARIATE FOR ITBS MATHEMATICS PROBLEMS SCORES FOR FOURTH GRADE EXPERIMENTAL STUDENTS

SEX	Race					
	Caucasian			Negro		
	Raw Means	Covariate Means	*Adjusted Means	Raw Means	Covariate Means	*Adjusted Means
Male	10.11	45.01	2.46	7.39	28.72	2.51
Female	10.05	52.46	1.14	7.96	34.75	2.06

*Regression Coefficient = .17

To analyze the ITBS scores for fourth grade experimental students a 2 X 2 factorial analysis of covariance was made using scores from the Cognitive Abilities Test as the covariate. The two independent variables were sex and race. The F-Ratios for the eleven dependent variables from the ITBS are presented in Table 22. A perusal of the F-Ratios reveals that none of the eleven achievement areas showed significance at the .05 level for either the sex effect, the race effect, or the interaction effect. In other words, the scores from eleven achievement areas failed to demonstrate a significance in achievement at the .05 level between males and females as well as between Caucasian and Negro students. No significance at the .05 level for interaction between sex and race in the eleven achievement areas was reached. The raw means, covariate means, and adjusted means for sex by race for vocabulary, reading, spelling, capitalization, punctuation, language usage, map skills, graph skills, reference skills, mathematics concepts, and mathematics problems are shown in Tables 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, and 33 respectively.

Interest in School

A 2 X 2 X 2 factorial analysis of variance was made on the total scores from the School Interest Inventory (SII) for sixth grade students in the experimental and control schools. While there was no significant sex effect or interaction effect at the .05 level, there was a highly significant treatment effect at the .01 level ($F_{1,87} = 18.43$) and a significant race effect at the .05 level ($F_{1,87} = 5.89$). A further analysis of the means of the two levels for treatment and race showed that control students ($\overline{X} = 124.43$) scored significantly higher at the .05 level than experimental students ($\overline{X} = 82.55$) and that Negro students ($\overline{X} = 115.33$) scored significantly higher at the .05 level than Caucasian students ($\overline{X} = 91.85$). The SII was designed to predict school dropouts; the higher the SII score, the greater the chances that the individual will become a school dropout. Consequently, the analysis of the two levels for treatment and race indicates that control students had a greater chance of becoming school dropouts than experimental students. That is to say, control students were less interested in school than experimental students as measured by the SII. Negro students were more likely to become school dropouts than Caucasian students, or Negro students were less interested in school than were Caucasian students.

Attention to Task

An analysis of the systematic observations in the IPI and Non-IPI classrooms revealed a difference in the percentage of off-task behaviors.

Using the formula provided by the method of observation (Madsen and Madsen, 1970), off-task behaviors across teachers, periods, and days for Non-IPI classes were 6.8 percent of the total classroom behaviors and for IPI classes were 5.5 percent of the total classroom behaviors. A .98 Pearson Product Moment Correlation Coefficient for inter-observer reliability was calculated from the data. The criteria for off-task behavior in IPI differed from the criteria for Non-IPI classes in that during IPI classes students were permitted to go to the IPI Material Centers, the library, and the IPI Audio Rooms. In addition, freedom to move around the classroom, freedom to tutor classmates, and freedom to talk to teachers and aides were considered on-task behavior for IPI classes while this kind of behavior was not considered so for Non-IPI classes. Consequently, any interpretation of the difference in off-task and on-task behavior of the same students in IPI and Non-IPI classes must be made with the view that the off-task behavior tallies were made using the class rules constructed by the teachers to be compatible with each teaching method. Students were off-task a slightly greater amount of time during Non-IPI classes than during IPI classes.

Opinions of Migrant Students

The interviews by the migrant social workers with fifty migrant students in the IPI program revealed a positive feeling by the migrant students toward IPI. Table 34 shows the percent of migrant students giving positive or negative responses to the questions in the interview. An examination of the percent of positive and negative responses shows that a large majority of the students felt positively about attending school, the IPI subjects, and the freedom in behavior it fostered. A large majority revealed that they talked about IPI at home and that they did not worry about failing in school.

Teacher Morale

A 2 X 3 analysis of variance was made on total scores of the Purdue Teacher Opinionaire (PTO) for the elementary teachers in the experimental and control counties. Treatment and teaching experience were the two independent variables. The two levels for treatment were IPI and Non-IPI instructional requirements. The three levels of teaching experience were categories of numbers of years. For example, level A was for those with one to three years of experience; level B was for those with four to nine years of experience; level C was for teachers with ten or more years of experience. No significant treatment effect or interaction effect was reached at the .05 level of confidence. However, there was a significant experience effect ($F_{2,198} = 6.74$) at the .01 level of confidence. Further analysis of the difference between the means for experience showed that teachers with four to nine years of experience scored significantly higher at the .01 level than teachers with

TABLE 34

PERCENTAGE OF POSITIVE AND NEGATIVE RESPONSES BY MIGRANT STUDENTS TO INTERVIEW QUESTIONS ON IPI

QUESTION	RESPONSE	
	Yes	No
1. Do you like to go to school here?	96.0	4.0
2. Does IPI make you like school here more than in other places you have gone to school?	91.5	8.5
3. Do you worry about failing in school?	22.0	78.0
4. Do you ever think IPI is too easy for you?	32.7	67.3
5. Do you ever think IPI is too hard for you?	46.9	53.1
6. Do you like working at your own prescription in IPI while other students in class are working at something different in IPI?	87.8	12.2
7. Do you ever tell your Mama and Daddy about the things you learn in school?	72.0	28.0

one to three years of experience or teachers with ten or more years of experience. High PTO scores mean high morale.

IPI Summary Profiles

The IPI program provided a graphic summary of student placement through the Summary IPI Profiles charted at the conclusion of the school year. The profiles function as an unobtrusive measure of the working place of students in the IPI material for the entire school population. Caution should be observed in interpreting these profiles in that the levels for each mathematics and reading area are not equal units of measure. Each level of each area has a different number of objectives and skills to be mastered before a student may start work on the next area level. Consequently, changes from year to year in the percentage of students in one level of the profile may not have equal or similar meaning for percentage changes from year to year in another level of an area.

Table 35 and Table 36 show the percentage of experimental students working in each level of the IPI Mathematics continuum at the conclusion of the first year of the program and the second year of the program respectively. An examination of these percentages reveals that, in general, the majority of students placed in the middle levels of the mathematics continuum for both years, and there was an increase in the upper levels, that is, levels E, F, and G, after the second year of the program. There was a considerable change in the percentage of students in levels D and E with more students in level E and fewer in level D for the second year than for the first year of the program. Only a very slight increase in percentage was shown for level G, the highest level. There was an increase in percentage for level A, the lowest level of the continuum. While this should not be interpreted as a definite spreading trend because of the small increases and levels involved, the changes are noticeable at both ends of the continuum. In terms of mathematics areas, the largest percent of students finished in the addition and subtraction areas for both years. There was a noticeable increase in percentages in numeration, place value, and combination of processes for most levels. There was a decrease in the percentages in the areas of applications or special topics and numeration for most levels.

The percentage of experimental students in each level of the IPI Reading continuum at the end of the 1970-71 and 1971-72 school years are presented in Table 37 and Table 38 respectively. In general, most of the students were in the lower levels of the continuum, that is, levels E, F, and G, for the first year of the program. While most of the students were again in the lower levels of the continuum for the second year, there was a noticeable trend toward the upper levels. In particular, a very small percent of students were in the highest level, that is, level K, for the 1971-72 school year while no students reached that level for

TABLE 35

PERCENTAGE OF STUDENTS IN EACH LEVEL OF THE 1970-71 IPI MATH PROFILE OF THE EXPERIMENTAL SCHOOLS

Mathematics Area	A	B	C	D	E	F	G
Numeration			3.4	5.8	5.2	.6	.1
Place Value			1.5	3.6	2.8	.2	
Numeration/ Place Value	1.0	1.7					
Addition			3.1	1.8	.9	.1	
Subtraction			1.3	2.9	1.2	.1	
Addition/ Subtraction	8.7	6.4					
Multiplication		2.0		1.0	2.8	1.0	
Division		1.5		2.4	1.6	1.0	
Combination of Processes			2.2	2.1	1.2		
Fractions	.4	1.0	2.1	2.7	1.2	.8	
Money	.1	.1	.9	1.2	.3		
Time		.8	1.0	2.2	1.2	.1	
Systems of Measurement		.8	.6	3.7	1.9		
Geometry		.4	.4	.2	.8	.1	
Applications, or Special Topics		1.6	.6	1.1	.4	.1	
Total	10.2	16.3	17.1	30.7	21.5	4.1	.1

N = 1,442

TABLE 36

PERCENTAGE OF STUDENTS IN EACH LEVEL OF THE 1971-72 IPI MATH PROFILE OF THE EXPERIMENTAL SCHOOLS

Mathematics Area	A	B	C	D	E	F	G
Numeration			1.7	3.6	2.3	2.5	.4
Place Value			1.2	2.9	1.6	.4	
Numeration/ Place Value	2.2	2.1					
Addition			2.2	.9	1.6	.3	
Subtraction			1.4	1.5	3.2	.1	
Addition/ Subtraction	8.4	5.4					
Multiplication		3.2		.7	3.3	1.9	.1
Division		.9		1.2	3.2	2.2	
Combination of Processes			2.3	1.5	1.9	.5	
Fractions	.4	.5	1.4	1.6	3.7	1.1	.1
Money	.5	.4	.8	1.1	1.5	.1	
Time		.2	1.3	1.6	2.1	.2	
Systems of Measurement		1.5	1.3	1.8	2.9	.1	
Geometry		.6	.3	.6	1.1		
Applications, or Special Topics		.4	.4	.4	1.1	.1	
Totals	11.5	15.2	14.3	19.4	29.5	9.5	.6

N = 1,583

TABLE 37

PERCENTAGE OF STUDENTS IN EACH LEVEL OF THE 1970-71 IPI READING PROFILE OF THE EXPERIMENTAL SCHOOLS

Reading Area	E	F	G	H	I	J	K
Structural Analysis	2.9	7.5	2.2	.7	.5	.1	
Vocabulary Development	3.0	1.2	.5	.5	.4		
Literal Comprehension	3.7	5.1	4.3	.5	.3		
Interpretive Comprehension	3.2	1.6	3.5	1.7	1.0	.1	
Evaluative Comprehension	1.8	2.5	4.1	1.2	.8	.3	
Library Skills	3.0	7.6	6.0	1.4	1.3		
Reference Skills	9.3	9.4	1.3	.8	.3		
Organizational Skills		2.7	1.5	.1	.1		
Totals	26.9	37.6	23.4	6.9	4.7	.5	

N = 764

TABLE 38

PERCENTAGE OF STUDENTS IN EACH LEVEL OF THE 1971-72 IPI READING PROFILE OF THE EXPERIMENTAL SCHOOLS

Reading Area	E	F	G	H	I	J	K
Structural Analysis	3.4	5.3	3.4	1.2	.2	.4	.2
Vocabulary Development	.3	.9	1.7	.8	2.1	.3	
Literal Comprehension	1.1	2.0	5.2	1.4	1.5	.4	
Interpretive Comprehension	1.1	.4	4.1	2.7	1.4	.3	
Evaluative Comprehension	.6	2.3	4.7	.8	.4	.4	
Library Skills	.9	7.0	5.9	3.8	3.8		
Reference Skills	3.8	8.8	3.5	2.0	.8	.4	
Organizational Skills		3.8	3.7	.6	.2		
Totals	11.2	30.5	32.2	13.3	10.4	2.2	.2

N = 656

the 1970-71 school year. At level E, the lowest level on the profile, there was a considerable change in percentages from 26.9 in 1971 to 11.2 in 1972. Major shifts in percentages occurred in the lower and middle levels of the continuum, especially in levels F, G, and H. The greatest change was in level G in which 23.4 percent of the students were working in 1971 and 32.3 percent in 1972. For the 1970-71 school year, the reading areas containing the greatest percent of students were reference skills and library skills. The same areas had the greatest percent of students at the end of the 1971-72 school year. The greatest change in percentages for the two years occurred in the area of structural analysis with a marked increase in percentage of students in this area for the second year.

Discipline Referrals

The monthly records of discipline referrals kept by the principals in the experimental and control schools depict a great contrast in the number and types of discipline problems referred to them throughout the year. Table 39 shows the total number of discipline problems in eleven general categories sent to the principal by teachers during the 1971-72 school year. The control schools had a greater number of total discipline referrals than the experimental schools. Fighting, antisocial behavior, disobedience on the school bus, and disobedience in the classroom were the types of discipline referrals showing a greater contrast in the control and experimental schools. The former recorded a greater number than the latter. There was small difference between the experimental and control schools in the numbers recorded for incorrigible behavior and stealing. The graph in Figure 3 compares the total monthly discipline problems referred to principals in the experimental and control schools. There were more discipline referrals in the control schools than in the experimental schools for every month of the school year. A sharp difference is shown in the increases in referrals during the school year. Referrals in the control schools increased from twenty-two in September to sixty-eight in October. For the same months, experimental school referrals only increased from twenty to twenty-two. There was a marked drop in the number of referrals for both kinds of schools during November, and in December referrals for the control schools dropped even more, leaving them with only seven more referrals than the experimental schools. The number increased for both kinds of schools from December to January, but the increase was much greater for the control schools. Referrals more than doubled from December to January and again from January to February in the control schools. During the same time periods, referrals in the experimental schools increased noticeably from eight in December to fourteen in January but with only a small increase from January to February. However, the Christmas holiday period during December

TABLE 39

TYPES AND NUMBERS OF DISCIPLINE PROBLEMS REFERRED TO PRINCIPALS IN EXPERIMENTAL AND CONTROL SCHOOLS

Types of Discipline Problems	Schools	
	Experimental	Control
Antisocial behavior	14	79
Disobedience on bus	0	35
Disobedience in class	10	60
Disorderly conduct on campus	28	49
Disrespect	3	26
Fighting	41	149
Incorrigible	2	0
Leaving school without permission	15	8
Profanity and Obscenity	15	20
Stealing	10	14
Tardiness	3	6

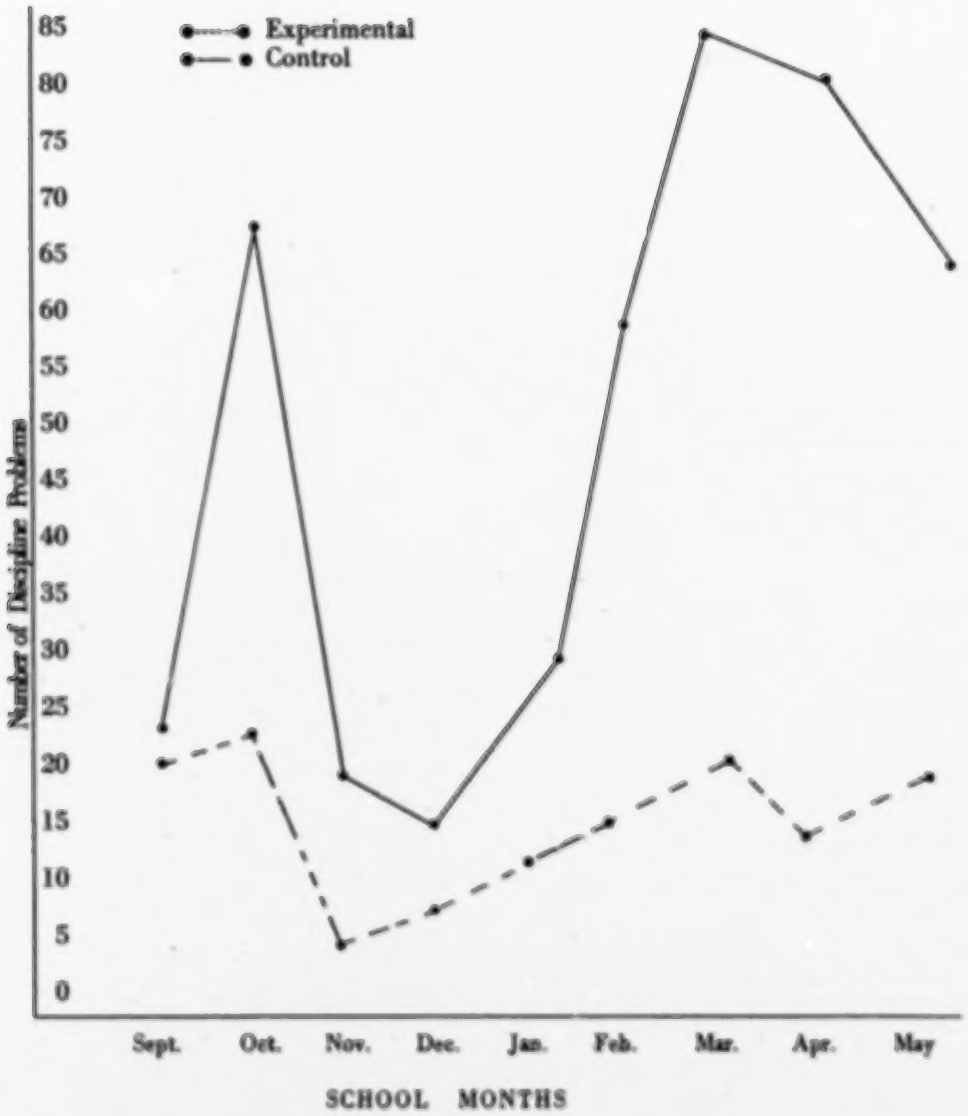

Fig. 3 Comparison of discipline problems referred to principals in the experimental and control school.

limited the school days that month to a two-week period. The decrease in school days for December could have been a contributing factor to the sharp decrease in discipline referrals for that month. The peak month for referrals in the control schools was March with a number of eighty-four, and during the remaining two months of school there was a decided decrease for each month. In contrast, there was an increase in referrals for the experimental schools during March which almost reached the peak number of twenty- two in October. A decided decrease was shown from March to April and then an abrupt increase from April to May which almost reached the peak number referred in October. In general, both types of schools recorded increases between September and October and from December to March. Decreases occurred from November to December.

Psychoeducational Referrals

Table 40 presents the types and numbers of psychoeducational referrals made by teachers in the five IPI elementary schools in Lowndes County for four years. Examination of the number of children with emotional problems who were referred to social workers shows a small decrease from the 1968-69 school year to the 1969-70 school year. The sharp decrease in referrals for this type of problem during the first year of IPI, that is, the 1970-71 school year, is particularly noticeable. However, referrals greatly increased during the second year of IPI during the 1971-72 academic year. The increase made the number of referrals for the 1971-72 school year the same as the number for the year preceding the IPI program. General behavior problems and attendance problems remained relatively constant over the four years. General behavior problems decreased by one over the four years, and attendance increased by two over the four years. From 1969 to 1972, attendance problems remained constant with only seven referrals for each of these years.

TABLE 40

TYPES AND NUMBERS OF PSYCHOEDUCATIONAL REFERRALS MADE BY TEACHERS IN IPI SCHOOLS TO SOCIAL WORKERS FOR FOUR YEARS

School Years	Psychoeducational Problems		
	Emotional	General Behavior	Attendance
1971-1972	60	7	7
1970-1971	18	6	7
1969-1970	60	6	7
1968-1969	75	8	5

Parent Opinion

Table 41 shows the results of an opinion poll of parental feelings toward IPI. A random sample of 661 parents from all of the IPI schools in Lowndes County was used in a poll conducted by mail. With an eighty-one percent return of the questions sent by mail, most of the responding parents reported positive feelings toward the IPI program in general. A large majority felt that the program helped student learning. Most parents responded that their children seemed to like the program and talked about it at home. A considerable majority of the responding sample parents felt that their children had shown about the same amount or more interest in school since the initiation of IPI in the Lowndes County Schools. In addition, a large majority of these parents felt that student desire to attend school had been positively affected by IPI. Most responding parents felt that if their children were given the choice, they would choose to stay in the IPI program. When asked if they would like to see the program continued, a large percent responded they would like to keep it as it was then. Some desire for the inclusion of more homework was expressed by a considerable majority of responding parents. When the result of this poll is compared with the opinion survey conducted by Sharp and Neville (1971) for the first year's evaluation of the program, the greatest difference in opinion concerns the question of homework. When affirmative answers to the question about homework were combined, 55.4 percent of responding parents favored more homework after the first year of the program, but after the second year, a noticeable increase, seventy percent of parents desired more homework for IPI subjects. However, a comparison of responses to other questions included in the opinion polls for both years shows that parental responses did not differ significantly from year to year. Most parents felt positively about the helpfulness of the program for learning, increasing interest in school, and desire to attend school.

TABLE 41

PERCENTAGE OF PARENTS RESPONDING TO OPINION CATEGORIES FOR IPI OPINION POLL

QUESTIONS	RESPONSES				
1. How much have the people at the elementary school been able to help your child's learning this year?	very much	some	undecided or don't know	little	none
	58.9	30.2	7.8	2.4	.7
2. Does your child talk about the IPI program when he is at home?	talks a lot about IPI	talks some about IPI	talks about all subjects about the same	talks less about IPI	does not talk about IPI
	36.2	46.4	8.4	1.6	7.4
3. If your child attended school before IPI, does he seem to like school better since being in the IPI program?	likes it much better	likes it better	likes it about the same	likes it less	does not like it
	38.3	39.9	19.9	1.7	.2

4. Does your child show a greater interest in what he is learning since starting the IPI program?	shows lot more interest	shows more interest	shows about the same interest	shows less interest	is not interested at all
	28.6	44.1	24.5	2.8	0
5. How has the IPI program affected your child's desire to attend school?	wants to attend a lot more	wants to attend more	about the same	wants to miss school more	does not want to go at all
	21.0	31.2	47.6	.1	.1
6. Do you feel your child should have more homework in IPI ?	yes, a lot more homework	yes, some homework	about the same amount of homework	less amount	none
	17.1	56.9	18.4	1.4	6.2
7. Do you feel your child would choose to stay in the IPI program if he were given the choice?	definitely yes	probably	undecided or don't know	probably no	definitely no
	61.5	28.8	6.8	2.8	.1

8. Would you like to see the IPI program in the elementary school continued?	yes, just as it is	yes, with some changes	undecided or don't know	mixed feelings	no
	73.5	11.4	7.6	5.8	1.7

CHAPTER FOUR

CONCLUSIONS AND RECOMMENDATIONS

The multidimensional data collected for this evaluation research provided information from which meaningful conclusions could be drawn. Not only should these conclusions and the recommendations evolving from them augment program decisions, but they should also be helpful to administrators and taxpaying citizens in understanding some of the effects of a systems approach to change and some of the practical benefits of educational innovations. In determining the degree and quality of the implementation and maintenance of the IPI program, changes within students and changes within the system were examined in depth. The use of control groups for most of the areas studied added to the strength of the conclusions, particularly for the investigations of changes within students. Various unobtrusive measures yielded descriptive information in some areas related to change within the system. This chapter discusses sequentially the conclusions made on the basis of these studies of change for the areas of achievement, interest in school, opinions of parents and migrant students, attention to task, discipline referrals, psychoeducational referrals, IPI summary profiles, and teacher morale. Recommendations for the IPI program and a brief discussion of each recommendation are contained in this chapter as well.

CONCLUSIONS

Based on the analysis of experimental and control student scores, the dimension of student achievement appears to have been differentially affected by the IPI program. Statistical significance at or beyond the .05 level was reached for all but one of the achievement areas when an analysis of the achievement data was made comparing experimental and control students in the second grade. Experimental second grade students scored significantly higher than control students in reading and spelling. Control male students in the second grade scored significantly higher than experimental males in mathematics. No significant difference was found between experimental and control students in the area of study skills for second grade students, and no significant difference was found in the areas of mathematics, reading, study skills, and spelling for third and fifth grade students. However, female students in the experimental and control schools scored significantly higher in mathematics, reading, and study skills than male students in the fifth grade. That IPI students spent less time both in the classroom and at home working on subject matter material in IPI should be noted because of the perspective it might give on the above results. According to systematic observations in randomly chosen experimental classrooms, IPI students spent on the average only sixty-two percent of the IPI class periods on academic material. In addition, IPI students rarely had homework in IPI subjects while control students had considerable amounts. The mixed effect the IPI program had on achievement for the second, third, and fifth graders when compared with controls may have been a function of the experience of the personnel in implementing the program. After two years of IPI, more achievement areas showed statistical significance at or beyond the .05 level when experimental and control students were compared than at the conclusion of the first year. After two years of the program, greater differences between experimental and control students seem to appear in the second grade than in higher grades. While third grade experimental and control students did not score significantly different from each other, an examination of the statistical analysis of these students' scores after one year of IPI (Sharp and Neville, 1971) showed that control male students with above average and average intelligence scored significantly higher in mathematics than experimental male students with similar ability. However, a difference between experimental and control males in mathematics achievement after one year of the program failed to remain statistically significant after two years of the program. Another year of IPI may reveal clearer trends in achievement differences for all of the grades tested.

The analysis of IPI fourth grade Caucasian and Negro achievement scores failed to demonstrate a significant difference at or beyond the

.05 level between the two groups when mental ability was used as a covariate. At this point, there is no evidence that the IPI program was better for one race than for another.

Interest in school was an area in which statistical significance was reached in comparing differences between experimental and control students. Based on the analysis of total SII scores, sixth grade students were more likely to become school dropouts in the control schools than in the experimental schools. Negro students in both the experimental and control schools were more likely to become school dropouts than Caucasian students. It appears that IPI may foster a holding power for schools. Of course, only a longitudinal study could validate adequately this posit.

Interviews with migrant students in IPI schools revealed that they had very positive attitudes toward school in general. Most of the migrant students came from culturally deprived families, and many of these students had a history of excessive absence from schools when enrolled in other geographic areas. Parents of IPI students felt positively about the IPI program in general, according to an opinion poll. There was a trend over a two-year span of time toward a strong desire by the parents for more homework for their children.

Analysis of data on attention to task and discipline referrals offered meaningful descriptions of classroom behaviors in IPI and Non-IPI periods and role differences of principals in experimental and control schools. In the experimental schools, students were on-task a slightly greater percent of the time during IPI periods than during Non-IPI periods. Note should be made that the class rules for on-task and off-task behaviors were different for IPI and Non-IPI periods. IPI class rules were more permissive in that students were allowed to leave and return to the classroom as needed, and talking to classmates as well as movement around the room were permitted under certain conditions. The off-task behaviors were recorded using the criteria written by the teacher for on-task and off-task behaviors during IPI and Non-IPI periods. Discipline referrals in experimental and control schools showed great differences in the number and types of discipline problems referred to the principals. Control schools had a greater total number of discipline problems referred to the principals than the experimental schools, and, in terms of discipline categories, control schools had a conspicuously greater number than experimental schools for fighting, misbehavior in the classroom, and misbehavior on the school bus. Many variables other than the IPI and Non-IPI treatments could have affected the difference in numbers of discipline referrals. It seems safe to say, however, that the role of the principal in the experimental schools did not call for as much time to be spent on discipline problems referred by teachers as did the role of the principal in the control schools.

Psychoeducational referrals for emotional problems greatly increased during the second year of IPI. Referrals remained approximately the

same for other kinds of psychoeducational problems. Again, many variables could have influenced this increase including the IPI treatment, increased awareness by the teachers of student problems after teaching on an individual basis, and the recent establishment of a regional center for emotionally disturbed children making therapeutic services available for these kinds of problems. However, to conclude that any one or all of these explains the increase would be a misuse of descriptive data.

A comparison of the IPI summary profiles for two years in mathematics and reading revealed changes in the numbers of students working at each level of the subject areas. Most students placed in the middle levels for the mathematics profile with a slight trend for more students to be working in the upper levels the second year of the program. However, there was only a very slight increase in the number of students in the highest level of the IPI mathematics continuum and an increase in the number of students at the lowest level of the continuum after two years. For both years the largest percent of students at the conclusion of school were working on different levels of addition and subtraction areas.

The majority of students were working in the middle levels of the IPI Reading continuum at the conclusion of the second year of the program. The greatest changes in percentages of students at each level of the continuum for the first and second years of the program were in the middle and lower levels. There appears to have been a greater percentage of students working in the middle levels than in the lower levels after two years of the program. The area of structural analysis had the greatest increase in percentages of students from year to year.

Many variables in addition to learning could have influenced the changes in the percentages of students in each level of these IPI continua. Student motivation, revisions in the IPI materials by RBS, another year of IPI teaching experience for some members of the faculties, aid from a part-time RBS consultant, attrition in the student bodies and faculties of the experimental school along with innumerable extraneous variables could have influenced the changes in the IPI profiles. However, the descriptive information they provide gives another dimension to the many ways of viewing changes in the system.

The analysis of the morale scores failed to show a significant difference at or beyond the .05 level between IPI teachers in the experimental county and Non-IPI teachers in the control counties. Based on this analysis, it seems safe to say that there is no evidence at this point that after experiencing a systems approach to change that the overall morale of IPI teachers was significantly lower than that of Non-IPI teachers in control counties who did not experience a systems approach to change.

RECOMMENDATIONS

The IPI program seems to have met its objectives in varying degrees. In addition, the program appears to have offered ways of meeting several of the high priority needs initiating its selection, especially the need for equality of educational opportunity and the need for self-determination. The findings from this evaluation study suggest the following recommendations:

1. The IPI program should be continued for a third year in grades one through six in the five elementary schools in Lowndes County.

2. A self-study should be made on the time demanded by the mechanical processes or logistics of the IPI system by a committee of teachers, principals, and consultants. Special attention needs to be focused on "down-time" and efficiency methodology.

3. A committee of teachers, principals, social workers, and school psychologists should conduct a self-study on the increased demand for psychoeducational services for emotional problems in IPI schools.

4. Techniques for involving parents and communities in Lowndes County with the IPI program in the schools should be continued and increased.

5. The feasibility of extending the IPI program into the first year of junior high school for those students who do not complete the IPI continua and into the second year of junior high school for slow learners should be explored.

6. A program should be developed for gifted students who may complete the IPI continua before the end of the school year.

The recommendation that the IPI program should be continued for a third year was made because the program had some positive effects on students during the second year of operation. The multidimensional data collected is supportive evidence that IPI second graders scored significantly higher in reading and spelling; IPI students were more interested in school than control students; students were on-task a slightly greater percent of the time during IPI periods than during Non-IPI periods; and migrant students expressed positive feelings about school in general and IPI in particular. Secondly, no evidence exists at this point that the program was any better for one race than for another. Third, some trends in achievement differences between

experimental and control students emerged after two years of the program. A third year of the program could reveal even more significant differences and clearer trends. In addition, there were some signs that changes within the system were in a positive direction, e.g., the principal's role in IPI schools and IPI summary profiles. Finally, parents of IPI students held positive opinions about the program in general.

The second recommendation that a self-study should be made on the logistics of the IPI system is supported by systematic observations clocking the amount of time spent on academic material and the amount of time spent during IPI periods on "other activities" related to logistics. It may be that more efficient use of IPI periods or the use of homework would increase the amount of time students spend on academic material thereby improving their chances of scoring significantly higher than control students. Perhaps a daily teacher planning period could be used to plan more efficient use of student time in IPI classes. Longer class periods and special seminars are among possible solutions to the problem. A growing majority of parents support the idea of an increase in homework, according to a parent opinion poll.

The third recommendation for a self-study on the increased demand for psychoeducational services for emotional problems is supported by the data on psychoeducational referrals made by teachers to the social workers. Interviews with students referred for emotional problems during the 1971-72 school year and systematic observations of teacher-pupil interactions in the classrooms are among the many techniques the committee might employ in their study of the pulsating parameters that may have influenced the increase in students referred for emotional problems from IPI schools.

Based on the numbers of citizens visiting the IPI schools and the positive opinions parents held about the program, techniques for involving parents and the communities in the county appear to have been effective, and the fourth recommendation suggests that these techniques be continued and extended. It may be possible to use creative variations of techniques already employed to involve greater numbers of individuals in the community.

The fifth and sixth recommendations are supported by the IPI summary profiles. A large percentage of students did not complete the IPI continua in reading and mathematics. Since these skills form supporting knowledge for so many of the subjects offered in the junior high school, the mastery of these reading and mathematics skills seems necessary before more advanced work could be expected of students. Hence, the extension of the IPI program into the seventh grade for those students who do not complete the continua and into the eighth grade for slow learners seems practical. While the IPI summary profiles showed that only a very small percentage of students were working in

the most advanced level of the continua after the second year of the program, it is possible that this percentage may increase after three years of IPI. A program for gifted students who may complete the continua before the end of the school year could involve special seminars, special projects, or free study time.

These recommendations were formulated to improve the IPI program while viewing its strengths and weaknesses. The need for the full cooperation of teachers, administrators, consultants, students, and parents in following these recommendations is apparent, and they will require an expenditure of time, effort, and thought by educators in the IPI program. However, these expenditures should be made with the knowledge that continued efforts toward perfecting innovations eventually may be the key to actualizing a truly relevant educational community that has the capacity to fully gratify developmental needs of students by teaching them on an individual basis.

REFERENCES

Anderson, Richard C. Current research on instruction. Englewood New Jersey: Prentice Hall, 1969.

Bentley, Ralph R., & Rempel, A. M. Manual for the Purdue teacher opinionaire. West Lafayette: Purdue Research Foundation, 1970.

Bishop, Lloyd K. Individualizing educational systems. New York: Harper and Row, 1971.

Bloom, B. S., Hastings, J. T., & Madaus, G. F. Handbook on formative and summative evaluation of student learning. New York: McGraw- Hill, 1971.

Bolvin, J. O., & Glaser, Robert. Developmental aspects of individually prescribed instruction. Audiovisual Instruction, 1968, 13, 828-831.

Buros, Oscar K. (Ed.) The sixth mental measurements yearbook. Highland Park, New Jersey: Gryphon Press, 1965.

California Achievement Tests. Bulletin of technical data number 1. Monterey, California: McGraw-Hill, 1970.

California Achievement Tests. Examiner's manual. Monterey, California: McGraw-Hill, 1970.

California Test of Personality. Manual. Monterey, California: McGraw-Hill, 1953.

Campbell, D. T., & Stanley, J. C. Experimental and quasi-experimental designs for research. Chicago: Rand McNally, 1963.

Comprehensive Tests of Basic Skills. Examiner's manual. Monterey, California: McGraw-Hill, 1969.

Cottle, William C. Examiner's manual for the school interest inventory. Boston: Houghton-Mifflin, 1966.

Cottle, William C. The school interest inventory. Psychological Reports, 1961, 9, 66.

Cronbach, Lee J. Essentials of psychological testing. New York: Harper and Row, 1970.

Dixon, W. J. BMD biomedical computer programs. Berkely, California: University of California Press, 1970.

Duncanson, James P. Learning and measured abilities. Journal of Educational Psychology, 1968, 220-229.

Ebel, Robert L. Measuring educational achievement. Englewood Cliffs, New Jersey: Prentice Hall, 1965.

Edwards, A. S. The measurement of personality traits by scales and inventories. New York: Holt, Rinehart, and Winston, 1970.

Freund, J. E. Modern elementary statistics. Englewood Cliffs: Prentice-Hall, 1952.

Gage, N. C. (Ed.) Handbook of research on teaching. Chicago: Rand McNally, 1963.

Glaser, Robert. Discussion, educational technology: New myths and old realities. Harvard Educational Review, 1968, 38, 739-746.

Glass, G. V., & Stanley, J. C. Statistical methods in education and psychology. Englewood Cliffs: Prentice-Hall, 1970.

Hawkbridge, D. G. Preparing evaluation reports: A guide for authors. Pittsburgh: AIR, 1970.

Insko, Chester A. Theories of attitude change. New York: Appleton-Century-Crofts, 1967.

Kirk, Roger E. Experimental design: Procedures for the behavioral sciences. Belmont, California: Brooks/Cole, 1968.

Kounin, Jacob S. Discipline and group management in classrooms. New York: Holt, Rinehart, and Winston, 1970.

Larson, R., & Byram, C. A. (Ed.) Teaching in IPI. Philadelphia: Research for Better Schools, 1971.

Lewis, James, Jr. Administering the individualized instruction program. West Nyack, New York: Parker, 1971.

Madsen, C. H., & Madsen, C. K. Teaching discipline: Behavioral principles toward positive approach. Boston: Allyn and Bacon, 1970.

Marx, M. H. (Ed.) Learning: Interactions. London: Macmillan, 1970.

McGuigan, F. J. Experimental psychology. Englewood Cliffs, New Jersey: Prentice-Hall, 1968.

Messick, D. M. (Ed.) Mathematical thinking in behavioral sciences. San Francisco: W. H. Freeman, 1968.

Myers, J. L. Fundamentals of experimental design. Boston: Allyn and Bacon, 1966.

Research for Better Schools. Progress report I: Individually prescribed instruction. Philadelphia, 1970.

Research for Better Schools. Progress report II: Individually prescribed instruction. Philadelphia, 1971.

Rohlf, F. James, & Sokal, Robert R. Statistical tables. San Francisco: W. H. Freeman, 1969.

Ruben, E. Random numbers and experimental design. American Statistician, 1969, 2, 32-34.

Scanlon, Robert G. Individually prescribed instruction. A system of individualized instruction. Educational Technology, 1970, 12, 44-52.

Scanlon, Robert G. The expansion of an innovation. Audiovisual Instruction, 1968, 13, 946-948.

Sharp, Christopher, & Neville, Sidney. Individually prescribed instruction . . . the first year. Report to the U. S. Office of Education. Lowndes County, 1971.

Short Form Test of Academic Aptitude. Examiner's manual. Monterey, California: McGraw-Hill, 1970.

Spiegel, Murray R. Theory and problems of statistics. New York: Schaum, 1961.

Sullivan, E. T., Clark, W. W., & Tiegs, E. W. Examiner's manual: California short-form test of mental maturity., Monterey, California: McGraw-Hill, 1963.

Thomas, G. I., & Crescambeni, J. Individualized instruction in the elementary school. New York: Random House, 1967.

Thorndike, R. L., & Hagan, E. Measurement and evaluation in psychology and education. New York: John Wiley and Sons, 1969.

Thorpe, L. P., Clark, W. W., & Tiegs, E. W. Manual: California test of personality. Monterey, California: McGraw-Hill, 1953.

Tiegs, E. W., & Clark, W. W. Examiner's manual: California achievement tests. Monterey, California: McGraw-Hill, 1971.

Travers, R. M. W. An introduction to educational research. New York: Macmillan, 1964.

Veldman, Donald J. Fortran programming for the behavioral sciences. New York: Holt, Rinehart, and Winston, 1967.

Wang, Margaret C., & Yeager, John L. Evaluation under individualized instruction. Elementary School Journal, 1971, 71, 448-452.

Webb, Eugene J. Unobtrusive measures: Non-reactive research in the social sciences. Chicago: Rand McNally, 1966.

APPENDIX A

SUPERINTENDENT'S LETTER TO PARENTS OF LOWNDES COUNTY ELEMENTARY PUPILS

If your child was in an elementary school in Lowndes County last year, you already know something about the Individually Prescribed Instruction (IPI) program at the elementary level. Our schools had several hundred visitors last year, mainly professional people from other systems in the state, to learn how the program operates. Many of them are now trying to get an IPI program in their own schools.

Last year, we had IPI Mathematics in all elementary grades, and IPI Reading beginning with Stage IV, which most of our ten-year-olds were ready to enter at some time during the year. This year, we will be adding Stages I, II, and III Reading which we hope will include almost all of our elementary pupils by the end of the year. A little later this year, we will go into IPI Spelling, beginning at level B. This should include most of our seven-year-olds by the end of the year. Any younger pupils who are ready will go into the program when they are ready.

Both the reading and spelling programs include the use of cassette tapes, with special machines and ear phones. These are used in the Audio Room, which has separate compartments for each child using the room. In the Audio Room, as well as the regular classroom, each pupil is working on his own prescription, which may be different from that of any other pupil.

Your child has his own individual prescription in math, reading, or spelling, that is made especially for him. Each child is different, and the prescriptions written for him will take into account his own needs, learning style, and speed. If it is necessary for him to be absent from school, he does not have to "catch up" with his classmates, but begins work again where he left off.

Placement tests help determine where a child will be placed in the continuum of skills. If your child was in a Lowndes County School last year, we have his record in the IPI subjects he had last year, and so know about where he is now. Once we find the beginning unit, we administer a Pre-Test to find out the specific skills in that unit that he needs. This way, we don't waste a child's time by giving him work that he already knows or that he is not ready for. After he has mastered all the skills

of a unit, he takes a Post-Test to see whether he is ready to go on to the next unit or needs additional work in some of the skills.

To work with the hildren in a particular classroom, their home-room teacher and a "floating teacher" work together writing prescriptions and giving individual help. An IPI Aide who has been trained to use these materials scores a child's work sheets or whatever has been prescribed for him, and records on his prescription sheet how well he did on that skill so that the teacher can decide what to prescribe next.

Pupils keep the materials they are working on, along with their prescription sheets and pofile sheets in a special folder. One of the students in the At Department at Lowndes High School designed the folder last spring. Different colored folders are used for the different subjects. Completed materials are kept by the aides in a record folder, so that a complete record of your child's work is available at all times. Homework in IPI subjects will be at an absolute minimum. Your child may go through the year with no homework at all in any IPI subject. In other subjects, there may or my not be homework.

The reports you receive this year on your child's progress will be the same as last year except for the added IPI subjects. You will receive a record sheet which tells you exactly which unit of math or reading, or which word list in spelling your child is working on. The teacher or principal will be happy to explain his progress to you at any time.

Most parents of IPI pupils seemed happy with their progress last year. We believe that you will be just as pleased with the new IPI subjects being added this year. Please visit or phone your school with any questions you may have about IPI.

APPENDIX B

SAMPLE OF RULES WRITTEN BY THE TEACHERS FOR ON-TASK OFF-TASK OBSERVATION CRITERIA

Rules for Sample Class X_1

1. Sharpen pencils during homeroom.
2. Raise hand to speak.
3. Walk in the building.
4. Keep hands and feet to yourself.
5. Talk to neighbors only with permission.
6. No talking if lights are off.
7. Stay in your seat unless you have permission to be up.
8. Keep our room clean.

Rules for Sample Class X_2

1. No talking during class time.
2. Keep hands and feet to yourself.
3. Come to the teacher's desk one at a time.
4. Walk in the building.
5. Quiet during rest time.
6. Do not disturb classmates.
7. Remember to take turns and be a good sport.
8. Move about the room as quietly as possible during IPI.

APPENDIX C

TABLE 4 2 '

YEARS OF TEACHING EXPERIENCE FOR TEACHERS
IN EXPERIMENTAL SCHOOLS

Years	Number	Percentage
1	7	10.0
2-3	27	38.6
4-5	7	10.0
6-9	7	10.0
10 or more	22	31.4
Total	70	

TABLE 43

YEARS OF TEACHING EXPERIENCE FOR TEACHERS
IN CONTROL SCHOOLS

Years	Number	Percentage
1	8	12.7
2-3	14	22.2
4-5	2	3.2
6-9	4	6.3
10 or more	35	55.6
Total	63	

TABLE 44

AGE OF TEACHERS IN EXPERIMENTAL SCHOOLS

Age	Number	Percentage
16-21	2	2.8
22-30	35	50.0
31-39	16	22.9
40-49	9	12.9
50 or over	8	11.4
Total	70	

TABLE 45

AGE OF TEACHERS IN CONTROL SCHOOLS

Age	Number	Percentage
16-21	0	0
22-30	17	27.0
31-39	16	25.4
40-49	9	14.3
50 or over	21	33.3
Total	63	

TABLE 46

SEX OF STUDENTS FROM THE SIXTH GRADE RANDOM SAMPLE IN EXPERIMENTAL AND CONTROL SCHOOLS

Sex	Experimental Number	Experimental Percentage	Control Number	Control Percentage
Male	26	53.1	24	52.2
Female	23	46.9	22	47.8
Total	49		49	

TABLE 47

OCCUPATIONS OF FATHERS OF STUDENTS FROM THE SIXTH GRADE RANDOM SAMPLE IN EXPERIMENTAL AND CONTROL SCHOOLS

Occupation	Experimental Number	Experimental Percentage	Control Number	Control Percentage
White Collar	12	24.5	5	10.9
Blue Collar	15	30.6	28	60.8
Farmer	3	6.1	5	10.9
Military	13	26.5	4	8.7
Professional	1	2.1	0	0
Other	5	10.2	4	8.7
Total	49		46	